Vol. 1119 Number 1

OFFICIAL GAZETTE

of the

UNITED STATES PATENT AND TRADEMARK OFFICE

Route to:

1790 ***Celebrating 200 Years of Creativity*** 1990

PATENTS

October 2, 1990

U.S. DEPARTMENT OF COMMERCE

Patent and Trademark Office

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OFFICIAL GAZETTE of the
UNITED STATES PATENT AND TRADEMARK OFFICE

October 2, 1990 Volume 1119 Number 1

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The following are mailed under direction of the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402, to whom all subscriptions should be made payable and all communications addressed.

THE OFFICIAL GAZETTE (PATENT SECTION), issued weekly.
THE OFFICIAL GAZETTE (TRADEMARK SECTION), issued weekly.
GENERAL INFORMATION concerning PATENTS.
GENERAL INFORMATION concerning TRADEMARKS.

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Printing authorized by Section 11(a)3 of Title 35, U.S. P.T.O.

PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning the PCT member countries see the notice appearing in the *Official Gazette* at 1118 O.G. 14 on Sept. 11, 1990.

For use of the European Patent Office as an International Searching Authority for international applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52 on Sept. 28, 1982.

For use of the European Patent Office as an International Preliminary Examining Authority for international applications filed in the United States Receiving Office, see the notices appearing in the *Official Gazette* at 1080 O.G. 2 on July 7, 1987 and at 1091 O.G. 2 on June 7, 1988. There is no longer a limit on the number of such international applications accepted for international preliminary examination by the European Patent Office; see the notice appearing at 1116 O.G. 32, on July 17, 1990.

The search fee of the European Patent Office was changed due to a difference in the exchange rate of the U.S. dollar in relation to the German Mark as of March 1, 1990, and was announced in the *Official Gazette* at 1111 O.G. 24 on Feb. 20, 1990.

International PCT fees were changed on September 1, 1990 due to a difference in the exchange rate of the U.S. dollar in relaton to the Swiss Franc and were announced in the *Official Gazette* at 1116 O.G. 32 on July 17, 1990.

Certain domestic PCT fees and charges for International Search and Preliminary Examination have been changed effective Apr. 17, 1989 and were announced in the *Official Gazette* at 1100 O.G. 24 on Mar. 7, 1989.

The current schedule of PCT fees (in U.S. dollars) is as follows:

Transmittal fee:	170.00
Search Fee	
U.S. Patent and Trademark Office (USPTO) as International Searching Authority (ISA)	
—No corresponding prior U.S. national application filed	550.00
—Corresponding prior U.S. national application filed	380.00
—Supplemental search fee, per additional invention	150.00
European Patent Office as ISA	1242.00
Preliminary examination fee	
USPTO as International Preliminary Examining Authority (IPEA)	
—Search fee paid to USPTO as ISA.	400.00
—Additional examination fee, per additional invention	130.00
—ISA not the USPTO	600.00
—Additional examination fee, per additional invention	200.00
International fees	
Basic fee	502.00
Basic Supplemental fee (for each page over 30)	10.00
Designation fee per country or region for the first 10 national or regional offices	122.00
Designation fee for 11th and subsequent designations	No Charge
Handling fee	154.00

U.S. National Stage fees

	Small Entity	Regular
USPTO was IPEA	165.00	330.00
USPTO was ISA but not IPEA	185.00	370.00
USPTO was neither ISA nor IPEA	250.00	500.00
USPTO was IPEA and all claims presented satisfied provisions of PCT Article 33(2) to (4)	25.00	50.00
—For each independent claim in excess of 3	18.00	36.00
—For each claim in excess of 20	6.00	12.00
—For each application containing a multiple dependent claim	60.00	120.00
—Surcharge for filing national fee or oath or declaration after the time limit applicable under PCT Article 22 or 39(1)	60.00	120.00
—Processing fee for filing English translation after the time limit applicable under PCT Article 22 or 39(1)	30.00	30.00

Aug. 16, 1990

HARRY F. MANBECK, Jr.
Assistant Secretary and Commissioner of Patents and Trademarks.

Status of Appeal Cases

The Date of Examiner's Answer of Oldest Ex Parte Appeals Awaiting Assignment to Panel For A Decision Without a Hearing as of August 31, 1990.

Chemical Discipline -	November 20, 1989
Mechanical Discipline -	April 3 1989
Electrical Discipline -	June 7, 1989

The Date of Examiner's Answer of Oldest Ex Parte Appeals Awaiting Setting of a Hearing Date as of August 31, 1990.

Chemical -	July 3, 1989
Electrical -	January 22, 1990
Mechanical -	August 7, 1989

Board of Patent Appeals and Interferences Decisions Rendered in Ex Parte Appeals During the Month of August 1990.

Affirmed	202
Affirmed-in-Part	52
Reversed	134
Total Decided	388

Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d), effective Nov. 1, 1984, provides that maintenance fees may be paid without surcharge for a six-month period beginning 3, 7, and 11 years after the date of issue of patents based on application filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth

in 37 CFR 1.20(k) or (l), as amended effective Apr. 17, 1989. If the maintenance fee is not paid in a patent requiring such payment the patent will expire on the 4th, 8th or 12th anniversary of the patent.

Attention is drawn to the patents which were issued on September 29, 1987 for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,696,064 through 4,697,284
Reissue Patents based on the above identified patents.

Attention is drawn to the patents which were issued on September 27, 1983 for which maintenance fees due at 7 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,406,021 through 4,407,020
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

The current amounts of the maintenance fees due at 3 years and six months and seven years and six months are set forth in 37 CFR 1.20(e), (f), (h) and (i), as amended effective Apr. 17, 1989, which are reproduced below:

37 CFR § 1.20 Post-issuance fees

"(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant.....$245.00

"(f) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 8 years; the fee is due by seven years and six months after the original grant.....$495.00"

"(h) For maintaining an original or reissue patent except a design or plant patent, based on an application filed on or after Aug 27,1982, in force beyond 4 years; the fee is due by three years and six months after the original grant:

By a small entity (§1.9(f)).....$245.00
By other than a small entity.....$490.00"

"(i) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Aug. 27, 1982, in force beyond 8 years; the fee is due by seven years and six months after the original grant:

By a small entity (§1.9(f)).....$495.00
By other than a small enttity.....$990.00"

The amounts of the surcharges as amended effective Apr. 17, 1989, are set forth in 37 CFR 1.20 (k), (l) and (m) which are reproduced below:

"(k) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months , seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980 and before Aug. 27,1982.....$120.00"

"(l) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Aug. 27, 1982:

By a small entity(§1.9(f)).....$60.00
By other than a small entity.....$120.00"

"(m) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay is shown to the satisfaction of the Commissioner to have been unavoidable.....$550.00"

Notice of Expiration of Patents Due to Failure to Pay Maintenance Fees

35 U.S.C. 41 and 37 CFR 1.362(g) provide that if the required maintenance fee and any applicable surcharge are not paid in a patent requiring such payment, the patent will expire at the end of the 4th, 8th, or 12th anniversary of the grant of the patent depending on the first maintenance fee which was not paid.

According to the records of the Office, the patents listed below have expired due to failure to pay the required maintenance fee and any applicable surcharge.

PATENTS WHICH EXPIRED JULY 22, 1990
DUE TO FAILURE TO PAY MAINTENANCE FEES

Patent Number	Serial Number	Issue Date
4,339,840	06/251,118	7/20/82
4,339,850	06/278,050	7/20/82
4,339,882	06/280,264	7/20/82
4,340,019	06/219,993	7/20/82
4,340,071	06/273,323	7/20/82
4,340,189	06/254,031	7/20/82
4,340,230	06/232,115	7/20/82
4,340,251	06/271,540	7/20/82
4,340,293	06/275,011	7/20/82
4,340,310	06/294,270	7/20/82
4,340,325	06/220,244	7/20/82
4,340,340	06/217,573	7/20/82
4,340,363	06/229,769	7/20/82
4,340,396	06/217,207	7/20/82
4,340,408	06/256,946	7/20/82
4,340,455	06/281,920	7/20/82
4,340,470	06/222,360	7/20/82
4,340,514	06/278,340	7/20/82
4,340,517	06/216,649	7/20/82
4,340,523	06/220,957	7/20/82
4,340,544	06/289,071	7/20/82
4,340,547	06/269,750	7/20/82
4,340,548	06/216,033	7/20/82
4,340,595	06/226,485	7/20/82
4,340,618	06/245,762	7/20/82
4,340,620	06/238,627	7/20/82
4,340,653	06/249,018	7/20/82
4,340,658	06/240,403	7/20/82
4,340,670	06/275,171	7/20/82
4,340,685	06/228,625	7/20/82
4,340,686	06/224,685	7/20/82
4,340,695	06/252,051	7/20/82
4,340,698	06/243,053	7/20/82
4,340,699	06/278,845	7/20/82
4,340,735	06/227,251	7/20/82
4,340,745	06/242,011	7/20/82
4,340,751	06/240,789	7/20/82
4,340,762	06/216,034	7/20/82
4,340,842	06/172,286	7/20/82
4,340,904	06/219,826	7/20/82
4,601,066	06/715,227	7/22/86
4,601,068	06/787,082	7/22/86
4,601,070	06/745,868	7/22/86
4,601,072	06/640,867	7/22/86
4,601,078	06/602,217	7/22/86
4,601,081	06/657,175	7/22/86
4,601,087	06/629,513	7/22/86
4,601,104	06/703,048	7/22/86
4,601,120	06/669,776	7/22/86
4,601,125	06/816,426	7/22/86
4,601,129	06/620,107	7/22/86
4,601,132	06/689,065	7/22/86
4,601,136	06/501,137	7/22/86
4,601,140	06/722,139	7/22/86
4,601,158	06/554,977	7/22/86

Patent Number	Serial Number	Issue Date
4,601,161	06/698,232	7/22/86
4,601,162	06/713,520	7/22/86
4,601,166	06/605,626	7/22/86
4,601,170	06/568,433	7/22/86
4,601,171	06/762,575	7/22/86
4,601,172	06/762,576	7/22/86
4,601,180	06/807,763	7/22/86
4,601,181	06/552,971	7/22/86
4,601,182	06/679,738	7/22/86
4,601,185	06/702,912	7/22/86
4,601,186	06/701,519	7/22/86
4,601,189	06/639,366	7/22/86
4,601,191	06/711,650	7/22/86
4,601,210	06/605,868	7/22/86
4,601,212	06/759,190	7/22/86
4,601,216	06/584,437	7/22/86
4,601,220	06/650,074	7/22/86
4,601,221	06/670,419	7/22/86
4,601,222	06/705,352	7/22/86
4,601,226	06/641,805	7/22/86
4,601,228	06/562,468	7/22/86
4,601,251	06/391,853	7/22/86
4,601,252	06/567,744	7/22/86
4,601,253	06/747,798	7/22/86
4,601,254	06/478,321	7/22/86
4,601,261	06/693,667	7/22/86
4,601,262	06/567,941	7/22/86
4,601,268	06/583,997	7/22/86
4,601,281	06/289,403	7/22/86
4,601,285	06/501,364	7/22/86
4,601,294	06/424,425	7/22/86
4,601,301	06/746,529	7/22/86
4,601,302	06/580,370	7/22/86
4,601,303	06/685,002	7/22/86
4,601,304	06/639,229	7/22/86
4,601,312	06/782,081	7/22/86
4,601,313	06/622,017	7/22/86
4,601,318	06/592,349	7/22/86
4,601,333	06/728,018	7/22/86
4,601,335	06/642,217	7/22/86
4,601,339	06/625,430	7/22/86
4,601,342	06/710,360	7/22/86
4,601,347	06/556,040	7/22/86
4,601,348	06/644,065	7/22/86
4,601,362	06/608,210	7/22/86
4,601,376	06/543,383	7/22/86
4,601,381	06/535,998	7/22/86
4,601,383	06/556,691	7/22/86
4,601,384	06/300,348	7/22/86
4,601,385	06/589,231	7/22/86
4,601,386	06/551,855	7/22/86
4,601,391	06/699,721	7/22/86
4,601,397	06/653,131	7/22/86
4,601,399	06/656,476	7/22/86
4,601,400	06/531,261	7/22/86
4,601,408	06/573,934	7/22/86
4,601,411	06/548,773	7/22/86
4,601,412	06/549,351	7/22/86
4,601,416	06/668,823	7/22/86
4,601,418	06/284,695	7/22/86
4,601,427	06/643,842	7/22/86
4,601,440	06/756,200	7/22/86
4,601,450	06/715,889	7/22/86
4,601,451	06/441,993	7/22/86
4,601,456	06/711,703	7/22/86
4,601,466	06/469,916	7/22/86
4,601,468	06/568,751	7/22/86
4,601,478	06/703,306	7/22/86
4,601,485	06/726,678	7/22/86
4,601,486	06/672,658	7/22/86
4,601,488	06/678,653	7/22/86
4,601,503	06/542,488	7/22/86
4,601,504	06/603,087	7/22/86
4,601,505	06/641,218	7/22/86
4,601,545	06/610,686	7/22/86
4,601,549	06/671,716	7/22/86
4,601,552	06/663,323	7/22/86
4,601,553	06/661,833	7/22/86
4,601,554	06/690,438	7/22/86
4,601,558	06/702,877	7/22/86
4,601,559	06/573,388	7/22/86
4,601,561	06/655,027	7/22/86
4,601,566	06/639,590	7/22/86
4,601,578	06/497,672	7/22/86
4,601,589	06/736,330	7/22/86
4,601,594	06/565,184	7/22/86
4,601,606	06/677,791	7/22/86
4,601,619	06/664,695	7/22/86
4,601,620	06/566,228	7/22/86
4,601,631	06/579,162	7/22/86
4,601,632	06/679,988	7/22/86
4,601,645	06/697,853	7/22/86
4,601,646	06/536,612	7/22/86
4,601,647	06/571,186	7/22/86
4,601,655	06/662,852	7/22/86
4,601,657	06/665,625	7/22/86
4,601,662	06/640,803	7/22/86
4,601,663	06/744,192	7/22/86
4,601,664	06/712,482	7/22/86
4,601,667	06/752,610	7/22/86
4,601,675	06/613,804	7/22/86
4,601,682	06/574,332	7/22/86
4,601,687	06/689,910	7/22/86
4,601,689	06/588,059	7/22/86
4,601,695	06/597,428	7/22/86
4,601,697	06/679,447	7/22/86
4,601,698	06/651,297	7/22/86
4,601,703	06/683,865	7/22/86
4,601,708	06/773,573	7/22/86
4,601,711	06/686,003	7/22/86
4,601,713	06/743,705	7/22/86
4,601,719	06/576,564	7/22/86
4,601,722	06/666,335	7/22/86
4,601,734	06/707,648	7/22/86
4,601,744	06/698,484	7/22/86
4,601,746	06/623,134	7/22/86
4,601,748	06/540,611	7/22/86
4,601,757	06/709,203	7/22/86
4,601,762	06/654,005	7/22/86
4,601,763	06/659,643	7/22/86
4,601,774	06/660,489	7/22/86
4,601,776	06/708,048	7/22/86
4,601,792	06/774,247	7/22/86
4,601,799	06/625,517	7/22/86
4,601,817	06/652,898	7/22/86
4,601,822	06/557,163	7/22/86
4,601,830	06/315,668	7/22/86
4,601,833	06/736,952	7/22/86
4,601,842	06/603,540	7/22/86
4,601,850	06/685,071	7/22/86
4,601,851	06/569,005	7/22/86
4,601,859	06/607,037	7/22/86
4,601,862	06/750,209	7/22/86
4,601,869	06/420,056	7/22/86
4,601,871	06/495,386	7/22/86
4,601,887	06/428,947	7/22/86
4,601,895	06/678,626	7/22/86
4,601,903	06/729,206	7/22/86
4,601,914	06/613,193	7/22/86
4,601,936	06/718,653	7/22/86
4,601,946	06/634,517	7/22/86
4,601,953	06/706,559	7/22/86
4,601,971	06/513,710	7/22/86
4,601,998	06/723,694	7/22/86
4,602,006	06/608,340	7/22/86
4,602,019	06/575,412	7/22/86
4,602,029	06/661,003	7/22/86
4,602,030	06/614,937	7/22/86
4,602,031	06/741,935	7/22/86
4,602,040	06/719,679	7/22/86
4,602,041	06/464,978	7/22/86
4,602,053	06/613,413	7/22/86
4,602,056	06/733,239	7/22/86
4,602,080	06/507,639	7/22/86
4,602,102	06/683,546	7/22/86
4,602,109	06/686,735	7/22/86

Patent Nimber	Serial Number	Issue Date
4,602,134	06/479,874	7/22/86
4,602,171	06/415,735	7/22/86
4,602,182	06/614,190	7/22/86
4,602,185	06/672,245	7/22/86
4,602,187	06/625,486	7/22/86
4,602,189	06/541,702	7/22/86
4,602,204	06/700,037	7/22/86
4,602,209	06/605,804	7/22/86
4,602,239	06/665,903	7/22/86
4,602,255	06/603,334	7/22/86
4,602,259	06/397,306	7/22/86
4,602,264	06/522,315	7/22/86
4,602,265	06/599,000	7/22/86
4,602,304	06/748,745	7/22/86
4,602,320	06/703,772	7/22/86
4,602,337	06/469,287	7/22/86
4,602,338	06/528,575	7/22/86
4,602,348	06/450,914	7/22/86
4,602,349	06/569,894	7/22/86
4,602,361	06/571,654	7/22/86
4,602,372	06/549,823	7/22/86
4,602,376	06/643,457	7/22/86

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b).

4,648,714, Re. S. N. 07/560,027, Filed July 25, 1990, Cl. 356, MOLECULAR GAS ANALYSIS BY RAMAN SCATTERING IN INTRACAVITY LASER CONFIGURATION, Robert E. Benner, et al., Owner of Record: *University of Utah, Salt Lake City, Utah*, Attorney or Agent: Dennis H. Epperson, Ex. Gp.: 252

4,752,777, Re. S. N. 07/541,574, Filed June 21, 1990, Cl. 340/825, DELTA NETWORK OF A CROSS-POINT SWITCH, Peter A. Franazek, Owner of Record: *International Business Machines Corp., Yorktown Heights, N.Y.*, Attorney or Agent: Ronald L. Drumbeller, Ex. Gp.: 264

4,759,749, Re. S. N. 07/558,177, Filed July 26, 1990, Cl. 604/113, HEATER FOR PHYSIOLOGICAL FLUIDS, Wesley H. Verkaart, Owner of Record: *Level 1 Technologies, Inc., Plymouth, Mass.*, Attorney or Agent: Conrad J. Clark, Ex. Gp.: 336

4,763,897, Re. S. N. 07/567,307, Filed Aug. 14, 1990, Cl. 272/118, EXERCISE MACHINE WITH ADJUSTABLY POSITIONAL BAR, Brian T. Yakata, Owner of Record: *Inventor*, Attorney or Agent: Leighton K. Chong, Ex. Gp.: 332

4,763,975, Re. S. N. 07/568,587, Filed Aug. 16, 1990, Cl. 350/96.15, OPTICAL SYSTEM WITH BRIGHT LIGHT OUTPUT, Donald R. Scifres, et al., Owner of Record: *Spectra Diode Laboratories, Inc., San Jose, Calif.*, Attorney or Agent: Thomas Schneck, Ex. Gp.: 251

4,764,314, Re. S. N. 07/564,316, Filed Aug. 7, 1990, Cl. 261/62, DIFFUSER FOR AERATION BASIN, Norbert Schneider, Owner of Record: *Inventor*, Attorney or Agent: Steven Rosenblatt, Ex. Gp.: 135

4,766,741, Re. S. N. 07/571,870, Filed Aug. 22, 1990, Cl. 62/51.4R, CRYOGENIC RECONDENSER WITH REMOTE COLD BOX, Allen J. Bartlett, et al., Owner of Record: *Helix Technology Corp., Waltham, Mass.*, Attorney or Agent: Mary Lou Wakimura, Ex. Gp.: 344

4,774,964, Re. S. N. 07/571,447, Filed Aug. 21, 1990, Cl. 128/763, DISPOSABLE BLOOD COLLECTION DEVICE, Jean Banaldo, et al., Owner of Record: *Safety Ject, Rancho Cucamonga, Calif.*, Attorney or Agent: Robert R. Thorton, Ex. Gp.: 335

4,790,622, Re. S. N. 07/569,114, Aug. 17, 1990, Cl. 350/96.20, CONTACT FOR TERMINATING AN OPTICAL FIBER, Frank H. Levinson, et al., Owner of Record: *Raychem Corp., Menlo Park, Calif.*, Attorney or Agent: Dennis E. Kovach, Ex. Gp.: 251

4,792,536, Re. S. N. 07/567,461, Filed July 27, 1990, Cl. 501/70, TRANSPARENT INFRARED ABSORBING GLASS AND METHOD OF MAKING, George A. Pecoraro, et al., Owner of Record: *PPG Industries, Inc., Pittsburg, Pa.*, Attorney or Agent: Dennis G. Millman, Ex. Gp.: 118

4,804,788, Re. S. N. 07/569,059, Filed Aug. 13, 1990, Cl. 568/730, PREPARATION PROCESS OF 4,4-DIHYDROXYBIPHENYL, Yutaka Konai, et al., Owner of Record: *Kureha Kagaku K.K., Tokyo, Japan*, Attorney or Agent: Holly D. Kozlowski, Ex. Gp.: 126

4,821,812, Re. S. N. 07/570,083, Filed Aug. 20, 1990, Cl. 173/17, DAWN HOLE DRILL IMPROVEMENT, Joseph R. Ditz, Owner of Record: *Ingersoll-Rand Co., Woodcliffe Lake, N.J.*, Attorney or Agent: David W. Tibbott, Ex. Gp.: 324

4,842,168, Re. S. N. 07/570,934, Filed Aug. 22, 1990, Cl. 222/402.2, DISPENSING VALVE, Jean-Louis Bougamont, et al., Owner of Record: *Societe Francaise D'Aerosol et de Bouchage, "Les Miroirs", Courbevoie, France*, Attorney or Agent: Frank F. Scheck, Ex. Gp.: 314

4,856,805, Re. S. N. 07/568,276, Filed Aug. 15, 1990, Cl. 280/491.4, FOLDABLE TOW BAR, Darrel B. Davis, Owner of Record: *Inventor*, Attorney or Agent: Christopher Duffy, Ex. Gp.: 316

4,865,618, Re. S. N. 07/566,109, Filed Aug. 13, 1990, Cl. 8/411, NEW CHLORO-META-PHENYLENEDIAMINES, THEIR USE AS COUPLERS IN THE OXIDATION DYEING OF KERATINOUS FIBERS, DYEING COMPOSITIONS FOR HAIR CONTAINING THESE COMPOUNDS AND DYEING PROCESS USING THE SAID COMPOSITIONS, Alex Junino, et al., Owner of Record: *L'Oreal, Paris, France*, Attorney or Agent: Donald B. Deaver, Ex. Gp.: 115

4,889,169, Re. S. N. 07/571,869, Filed Aug. 22, 1990, Cl. 144/208J, COMBINATION LOG DEBARKER-CHIPPER, Arnold N. Peterson, et al., Owner of Record: *Peterson Pacific Corp., Dexteer, Oreg.*, Attorney or Agent: Robert L. Harrington, Ex. Gp.: 321

4,890,131, Re. S. N. 07/564,836, Filed Aug. 9, 1990, Cl. 354/299, AUTOMATIC FILM PROCESSORS, Roman Kuzyk, et al., Owner of Record: *Roman Kuzyk, Trenton, N.J.*, Attorney or Agent: John M. White, Ex. Gp.: 211

4,898,163, Re. S. N. 07/565,987, Filed Aug. 10, 1990, Cl. 128/200.26, TRANSTRACHEAL AIRWAY AND PLACEMENT DEVICE, Gordon P. George, Owner of Record: *Inventor*, Attorney or Agent: Gregory E. Upchurch, Ex. Gp.: 337

4,942,085, Re. S. N. 07/570,193, Filed Aug. 20, 1990, Cl. 428/288, METHOD OF MANUFACTURING A SAG-RESISTANT, BONDED PARTICULATE ARTICLE, Gerald J. Guerro, et al., Owner of Record: *American Cyanamid Co., Stanford, Conn.*, Attorney or Agent: Steven H. Flynn, Ex. Gp.: 154

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b).

4,306,856, Reexam. No. 90/002,117, Requested Aug. 27, 1990, Cl. 432/008, PRE-HEATING APPARATUS FOR A THERMOFORMING MACHINE, Raimondo Arippol, Owner of Record: *Inventor, San Paulo, Brazil*, Attorney or Agent: Robert C. Faber, Ostrolenk, Faber, Gerb & Soffen, New York, N.Y., Ex. Gp.: 344, Requester: Joseph B. Lerch, Darby & Darby, New York, N.Y.

4,687,526, Reexam. No. 90/002,119, Requested Aug. 29, 1990, Cl. 156/064, METHOD OF MAKING AN IDENTIFICATION CARD, Ronald A. Wilfert, Owner of Record: *Lasercard Co., L.P., Acton, Mass.*, Attorney or Agent: James Longacre, Cushman, Darby & Cushman, Washington, D.C., Ex. Gp.: 131, Requester: Edward J. Kondracki, Kerman, Stowell, Kondracki, & Clarke, Falls Church, Va.

4,693,293, Reexam. No. 90/002,120, Requested Aug. 29, 1990, Cl. 198/497, CONVEYOR BELT CLEANER, Robert T. Swinderman, Owner of Record: *Martin Engineering Corp., Neponset, Ill.*, Attorney or Agent: Dennis M. McWilliams, McWilliams, Mann, Zummer & Sweeney, Chicago, Ill., Ex. Gp.: 311, Requester: Arch Environmental Equipment Co., Paducah, Ky.

4,896,955, Reexam. No. 90/002,118, Requested Aug. 28, 1990, Cl. 351/041, EYEGLASS FRAME INCLUDING SHAPE-MEMORY ELEMENTS, Robert B. Zider, et al., Owner of Record: *CVI/Beta Ventures, Inc., Menlo Park, Calif.*, Attorney or Agent: James W. Peterson, Burns, Doane, Swecker & Mathis, Alexandria, Va., Ex. Gp.: 257, Requester: Owner

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DEPARTMENT OF COMMERCE
Patent and Trademark Office
37 CFR Part 2
Patent and Trademark Automated Search System Fees

Agency: Patent and Trademark Office, Commerce
Action: Listing of suspension of final rule
Summary: The Patent and Trademark Office (Office), on December 11, 1989, amended the rules of practice in patent and trademark cases, Parts 1 and 2 of Title 37, Code of Federal Regulations, setting forth the fees for public access to the Office's text data bases: the Automated Patent System (APS) and the automated trademark search system (T-Search). 54 FR 50942. That final rule became effective on February 12, 1990. On that date, 37 CFR 2.6(w), dealing with T-Search fees, took effect, but was immediately suspended by the Commissioner.

The collection of the fee was initially suspended to permit users to become familiar with the T-Search system. The T-Search system has been available to the public since April 1989, a sufficient time for users to become familiar with the system. Therefore, as provided in the final rule, the Office now gives notice that the suspension is lifted. The Office will begin to collect the fees set forth in 37 CFR 2.6(w) sixty (60) days from the date of this notice. Cost estimates based on usage and actual costs are available for inspection in the Office of Long-Range Planning and Evaluation, Room 507, Crystal Park 1, Crystal Drive, Arlington, Virginia.
Dates: The suspension of 37 CFR 2.6(w) is lifted as of Nov. 13, 1990. The collection of fees under 37 CFR 2.6(w) will begin on November 13, 1990
For Further Information Contact: Frances Michalkewicz by telephone at (703) 557-1610 or by mail to her attention and addressed to the Commissioner of Patents and Trademarks, Washington, D.C. 20231.

September 4, 1990

HARRY F. MANBECK, Jr.
Assistant Secretary and Commissioner of Patents and Trademarks

Service by Publication

A petition to cancel the registrations identified below having been filed, and the notice of such proceedings sent by certified mail to each registrant at the last known address having been returned by the Postal Service as undeliverable, notice is hereby given that unless the registrants listed herein, their assigns or legal representatives shall enter an appearance within thirty days from the date of this publication, the cancellations will be proceeded with as in the case of default.

Worldwide Sales & Marketing Inc., Miami Lakes, Fla., Reg. No. 1,388,387, for the mark "GINO CAPELLI", Canc. No. 18,778.

National Health Watch, Inc., Willoughby, Ohio, Reg. No. 1,312,730, for the mark "WELLSPRING", Canc. No. 18,910.

JEAN BROWN
Administrator of the Trademark Trial and Appeal Board
For JEFFREY M. SAMUELS
Assistant Commissioner for Trademarks

Service by Publication

A petition to cancel the registration identified below having been filed, and the notice of such proceedings sent by registered mail to registrant at the last known address having been returned by the Postal Service as undeliverable, notice is hereby given that unless the registrant listed herein, its assigns or legal representatives shall enter an appearance within thirty days from the date of this publication, the cancellation will be proceeded with as in the case of default.

Caras Ltd., New York, N.Y., Reg. No. 1,366,057, for the mark "FANGO DEL MARE", Canc. No. 18,351.

JEAN BROWN
Administrator, Trademark Trial and Appeal Board
For JEFFREY M. SAMUELS
Assistant Commissioner for Trademarks

Registration to Practice

The following list contains the names of persons applying for registration to practice before the United States Patent and Trademark Office. Final approval for registration is subject to establishing to the satisfaction of the Director of the Office of Enrollment and Discipline that the person applying for registration is of good moral character and repute. [37 CFR 10.7(a)]. Accordingly, any information tending to affect the eligibility of any of the following applicants on moral, ethical or other grounds should be furnished the Director, Office of Enrollment and discipline on or before Nov. 15, 1990.

Dennison, Caroline D., 7534 Cross Gate Ln., Alexandria, Va. 22310
Faber, Alan T., 509 Timer Ln., Falls Church, Va. 22046
Johnson, Lori-Ann, 6982 Old Brentford Rd., Alexandria, Va. 22310
McAndrews, Kevin P., 5722 4th St., S., Arlington, Va. 22204
Norris, Allen E., 571 S. Frances St., Sunnyvale, Calif. 94304
Ruston, David A., 450 Markham St., #3, Toronto, Ont., M6G 2L2, Canada
Swayze, Wilson D., Jr., 1600 Eads St., #1117-N, Arlington, Va. 22202

July 31, 1990

CAMERON WEIFFENBACH, *Director*
Office of Enrolment and Discipline

PATENT NOTICES

Certificates of Correction For Week of October 2, 1990

D. 304,358	4,848,812	4,863,163	4,870,730
Re. 33,131	4,849,049	4,863,322	4,870,744
4,563,309	4,849,192	4,863,331	4,870,845
4,750,269	4,849,447	4,863,376	4,870,974
4,755,269	4,850,104	4,863,487	4,871,157
4,763,463	4,851,460	4,863,684	4,871,803
4,804,965	4,851,867	4,863,922	4,871,997
4,811,553	4,852,364	4,864,088	4,872,342
4,811,841	4,853,181	4,864,097	4,873,177
4,812,215	4,853,571	4,864,110	4,873,272
4,813,532	4,853,672	4,864,138	4,874,268
4,817,340	4,853,992	4,864,144	4,874,290
4,820,770	4,854,402	4,864,359	4,875,381
4,823,377	4,854,808	4,864,567	4,876,168
4,823,926	4,855,041	4,865,642	4,876,268
4,825,913	4,855,066	4,865,822	4,876,422
4,828,573	4,855,149	4,866,244	4,876,460
4,830,838	4,855,151	4,866,363	4,876,845
4,832,150	4,855,332	4,867,008	4,877,290
4,833,296	4,855,459	4,867,123	4,877,484
4,835,532	4,858,173	4,867,233	4,877,638
4,838,668	4,858,305	4,867,243	4,878,308
4,841,023	4,859,388	4,867,869	4,878,310
4,841,030	4,859,472	4,868,093	4,879,241
4,841,642	4,859,663	4,868,111	4,879,844
4,842,606	4,859,842	4,868,251	4,880,654
4,843,129	4,859,867	4,868,275	4,881,796
4,843,221	4,859,896	4,868,340	4,882,271
4,843,587	4,860,094	4,868,606	4,882,794
4,845,158	4,861,043	4,868,760	4,883,876
4,845,722	4,861,056	4,868,908	4,884,144
4,845,736	4,861,542	4,869,264	4,888,492
4,846,649	4,861,614	4,869,766	4,891,244
4,846,790	4,861,860	4,869,775	4,894,410
4,848,361	4,862,653	4,869,950	4,901,698
4,847,391	4,862,714	4,869,969	4,930,872
4,848,592	4,863,066	4,870,597	4,931,617

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PATENT APPLICATION	New patent application and associated papers and fees.
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These patent collections, which are organized in patent number sequence, are available for use by the public free of charge. Each of the PDLs, in addition, offers supplemental reference publications of the U.S. Patent Classification System, including the *Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions*, and provides technical staff assistance in their use to aid the public, in gaining effctive access to information contained in patents. CASSIS (Classification And Search Support Information System); which provides direct, on-line access to Patent and Trademark Office data, is available at all PDLs. Facilities for making paper copies of patents from either microfilm or paper collections are generally provided for a fee.

Since there are variations in the scope of patent collections among the PDLs and in their hours of service to the public, anyone contemplating use of the patents at a particular library is urged to contact that library, in advance, about its collection and hours in order to avert possible inconvenience.

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PATENT EXAMINING CORPS

JAMES E. DENNY, Acting Assistant Commissioner
STEPHEN G. KUNIN, Acting Deputy Assistant Commissioner
CONDITION OF PATENT APPLICATIONS AS OF July 28, 1990

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, AND ENGINEERING, GROUP 110—D. E. TALBERT, Director.	7-7-87
ORGANIC CHEMISTRY GROUP 120—JOHN F. TERAPANE, JR., Director	11-21-88
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP— 130 BARRY S. RICHMAN, Director	5-12-88
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY, STOCK MATERIALS AND COMPOSITIONS, GROUP 150—J. O. THOMAS, Director	8-3-88
BIOTECHNOLOGY, GROUP 180—J. E. KITTLE, Director	1-28-87
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—D. G. Kelly, Director	10-15-87
SPECIAL LAWS ADMINISTRATION, GROUP 220—ROBERT E. GARRETT, Director	8-15-88
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ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 250—EDWARD E. KUBASIEWICZ, Director.	8-29-88
COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP— 260 STEWART LEVY, Acting Director	4-22-88
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SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 340—C. CROYLE, Acting Director	3-16-89
GENERAL CONSTRUCTIONS, PETROLEUM AND MINING ENGINEERING, GROUP 350— A. L. SMITH, Director	8-15-89

Expiration of patents: The patents within the range of numbers indicated below expire during July 1990 except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,742,517 to 3,750,191 inclusive
Plant Patents ..... 3,370 to 3,384 inclusive

REEXAMINATIONS

OCTOBER 2, 1990

Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

B2 3,845,351 (1361st)

METHOD AND APPARATUS FOR THE ADJUSTMENT OF A PLURALITY OF FLOODLIGHTS

Fritz von Ballmoos, Horgen; Traugott Grieder, Riehen, both of Switzerland; Herbert Grohmann, Stuttgart, Fed. Rep. of Germany, and Rolf Gutmann, Basel, Switzerland, assignors to Varible-Parameter Fixture Dev. Corp., New York, N.Y.

Reexamination Request No. 90/001,832, Aug. 28, 1989.

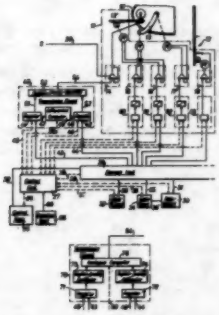
Reexamination Certificate for Patent No. 3,845,351, issued Oct. 29, 1974, Ser. No. 119,595, Mar. 1, 1971.

Reexamination Certificate B1 3,845,351, issued Oct. 13, 1987.

Filed Aug. 28, 1989, Ser. No. 119,595

Int. Cl.[5] G05F *1/00*; F21P *5/00*

U.S. Cl. 315—293



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claim **1** is confirmed.

1. Apparatus for adjusting a number of floodlights, especially for the illumination of a stage or studio, comprising a command console for the manual input of signals used for setting the value of different parameters such as azimuth, elevation, brightness, focus and color of the light bundle of each of the floodlights, a storage unit, input and output devices for transferring the content of said storage unit onto a data recording means or to transfer data from a recording means to the storage unit, respectively, a control unit for transforming the signals from the command console into reference values for setting the values of the different parameters into instructions for the sequence of operations in the apparatus, each floodlight being provided with a feedback control system for each parameter, the reference value signal input being connected with the output of at least one register having two inputs, one input of the register being connected with the control unit when adjusting the corresponding parameter by means of the command console, the other input of the register being connected with the storage unit when adjusting the corresponding parameter by means of the stored information, the signals at the output of each register being utilized as reference values for the corresponding feedback control system.

B1 4,024,535 (1362nd)

SOUND GENERATING SYSTEM FOR A SOUND MASKING PACKAGE

Harold Goldstein, Westbury, N.Y., assignor to Acoustical Design Incorporated

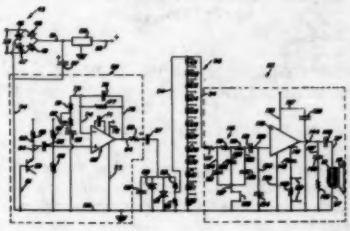
Reexamination Request No. 90/001,779, Jun. 5, 1989.

Reexamination Certificate for Patent No. 4,024,535, issued May 17, 1977, Ser. No. 700,596, Jun. 28, 1976.

Filed Jun. 5, 1989, Ser. No. 700,596

Int. Cl.[5] H04R *3/02*

U.S. Cl. 381—73.1



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1–10** is confirmed.

1. A sound generator for a sound masking package comprising, in combination, an electric circuit for continuously producing a signal voltage having an audible frequency range in which the frequencies are established at predetermined relative decibel levels, means for connecting said circuit to an associated source of electric power, a transducer for producing an audio output signal corresponding to said signal voltage, means for applying said signal voltage to said transducer, said electric circuit including noise generating means for producing an output noise signal means for converting said output noise into said signal voltage to produce a signal voltage having an audible frequency range in which the frequencies are established at predetermined relative decibel levels, and means for amplifying said signal voltage to produce an audio output signal from said transducer at a selected decibel level.

B1 4,518,654 (1363rd)

ONE-SIDED CLING STRETCH WRAP

George N. Elchbauer, Fairport, and Beth A. LeBlanc, Rochester, both of N.Y., assignors to Mobil Oil Corporation, N.Y.

Reexamination Request No. 90/001,898, Oct. 2, 1990.

Reexamination Certificate for Patent No. 4,518,654, issued May 21, 1985, Ser. No. 564,664, Dec. 23, 1983.

Filed Nov. 27, 1989, Ser. No. 564,644

Int. Cl.[5] B32B *27/06, 27/32*

U.S. Cl. 428—331

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1** through **10** is confirmed.

New claims **11** through **22** are added and determined to be patentable.

1. A stretch wrap film having one-sided cling comprising a transparent thermoplastic A/B film structure wherein layer A, in its stretched condition, has a comparatively high cling force to layer B and layer B has at least substantially no cling force to a layer of itself and has a slide property when layer B is in contact with a layer of itself with relative motion therebetween.

B1 4,695,901 (1364th)

METHOD AND APPARATUS FOR REMOVING PSEUDO-SYNC AND/OR A AGC PULSES FROM A VIDEO SIGNAL

John O. Ryan, Cupertino, Calif., assignor to Macrovision, San Jose, Calif.

Reexamination Request No. 90/001,958, Oct. 2, 1990.
Reexamination Certificate for Patent No. 4,695,901, issued Sep. 22, 1987, Ser. No. 836,019, Mar. 4, 1986.
Filed Mar. 13, 1990, Ser. No. 836,019
Int. Cl.[5] H04N *5/76*
U.S. Cl. 380—5

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

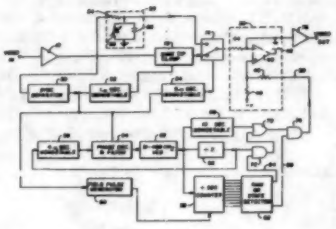
The patentability of claims 1–31 is confirmed.

1. A method of removing pseudo-sync pulses added after normal sync pulses to a video signal for inhibiting the making of acceptable video recordings of the video signal, comprising the steps of:

providing a selectively-operable negative-peak clipping device to pass unchanged the video signal in one operation state thereof and to pass the video signal with selected negative-value components thereof removed in a second operation state thereof;

detecting normal sync pulses and pseudo-sync pulses of the video signal;

selectively operating the clipping device in accordance with the detected sync pulses so that the video signal is padded



by the clipping device unchanged during the detection of normal sync pulses and passed by the clipping device as modified by the second operation state thereof during the detection of at least some of the pseudo-sync pulses, thereby outputting a video signal which is regenerated free from at least some of the added pseudo-sync pulses to permit more acceptable video recordings thereof.

STATUTORY INVENTION REGISTRATIONS

PUBLISHED OCTOBER 2, 1990

A statutory invention registration is not a patent. It has the defensive attributes of a patent but does not have the enforceable attributes of a patent. No article or advertisement or the like may use the term patent, or any term suggestive of a patent, when referring to a statutory invention registration. For more specific information on the rights associated with a statutory invention registration see 35 U.S.C. 157.

H823
CHEMICAL PROTECTIVE BALACLAVA

James P. Conkle, and William J. Sears, both of San Antonio, Tex., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed May 7, 1987, Ser. No. 46,604
Int. Cl.[5] A42B *1/06, 1/04*
U.S. Cl. 2—410 1 Claim

1. A protective balaclava which may be worn under a flight helmet and under a chemical respirator to provide additional protection against toxic chemical agents, said balaclava fitting over a wearer's head and neck and having a flared apron to cover said wearer's shoulders, said balaclava having a facial opening with an edge which serves as a mask seal when used with chemical respirators, and wherein said balaclava is fabricated entirely from activated charcoal cloth to provide absorptive layers for additional protection against chemical vapors.

H824
PLANT STEM HOLDER

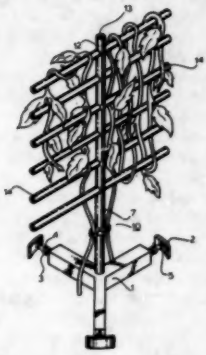
Serkai Ghafoorzai, 4031 Park Center, Apt. A, Fremont, Calif. 94538

Filed May 9, 1988, Ser. No. 191,425
Int. Cl.[5] A01G *17/06*
U.S. Cl. 47—44 5 Claims

1. A plant holder for supporting the stem of a plant, said holder comprising: p1 a tripodal base member which consists of a unitized hollow structure having three sleeve formations, said sleeves containing adjustably threaded stub feet that extend horizontally and outwardly of each other and from a center point, each stub foot being terminated at its outer end with a disk and having, intermediately disposed near its outer end, :) appended knurl, each of said stub feet being threadly engaged at its inner end to the tripodal base member;

a hollow and vertical stanchion, said stanchion extending integrally and upwardly from the center axis of the tripodal base, said stanchion being equipped with an intermediately positioned stem support brace; and

a hollow extension assembly that consists of a central rod integrally mounted onto the top end of the stanchion, said central rod having horizontally opposed and equidistantly

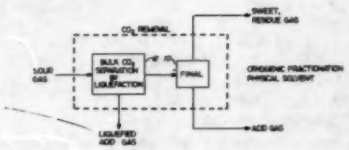


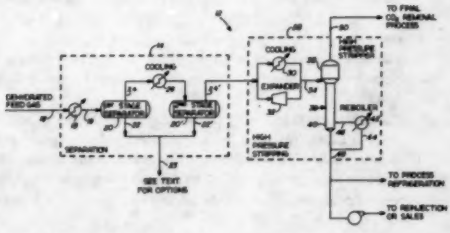
situated smaller rods detachably secured so as to provide a tier type plant support structure.

H825
PROCESS FOR CONDITIONING A HIGH CARBON DIOXIDE CONTENT NATURAL GAS STREAM FOR GAS SWEETENING

Joe R. Green, Houston, Tex., assignor to Exxon Production Research Company, Houston, Tex.

Filed May 20, 1988, Ser. No. 196,747
Int. Cl.[5] F25J *3/00*
U.S. Cl. 62—20 16 Claims





1. A process for pretreating a natural gas stream having greater than about 40 mole % carbon dioxide to remove therefrom a substantial quantity of the carbon dioxide as a high pressure liquefied product stream, comprising the steps of:

passing said gas stream through a separator zone at a temperature of from about 30° to about 80° F. while said gas

stream is maintained at a pressure of from about 600 psia to about 1200 psia to remove from said gas stream as a liquid condensate those gas components which are condensible at said temperature and pressure;

removing the liquid condensate from the separator zone;

feeding the gas stream from the separator zone through a stripping zone at a temperature of from about −20° to about 0° F. while maintaining said gas stream at a pressure of from about 600 psia to about 1200 psia to remove from said gas stream a substantial quantity of the carbon dioxide content as liquefied carbon dioxide.

10. A process for pretreating a natural gas stream having from about 40 to about 90 mole % carbon dioxide to remove therefrom a substantial quantity of the carbon dioxide as a high pressure liquefied product stream, comprising the steps of:

passing said gas stream through a separator zone at a temperature of from about 30° to about 80° F. while said gas stream is maintained at a pressure of from about 600 psia to about 1200 psia to remove from said gas stream as a liquid condensate those gas components which are condensible at said temperature and pressure;

removing the liquid condensate from the separator zone;

feeding the gas stream from the separator zone through a stripping zone at a temperature of from about −20° to about 0° F. while maintaining said gas stream at a pressure of from about 600 psia to about 1200 psia to remove from said gas stream a substantial quantity of the carbon dioxide content as liquefied carbon dioxide, thereby reducing the carbon dioxide content of the gas stream exiting the stripping zone to a range from about 30 to about 50 mole percent.

H826

LUBRICANT COMPOSITIONS CONTAINING A VISCOSITY INDEX IMPROVER HAVING DISPERSANT PROPERTIES

Carl L. Willis, 15922 Red Willow, Houston, Tex. 77084, and Andy M. Arismendi, Jr., 9707 Ravensworth, Houston, Tex. 77031

Filed Feb. 17, 1988, Ser. No. 157,348
Int. Cl.[5] C10M *149/06*
U.S. Cl. 252—51.5 A 23 Claims

1. A lubricant composition comprising

(a) a major amount of a lubricating oil; and

(b) a minor effective viscosity improving amount of an oil soluble, functionalized selectively hydrogenated block copolymer to which has been grafted an amide functional group, said functionalized block copolymer comprising:

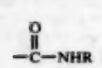
(1) a base block copolymer which comprises

(i) at least one polymer block A, said A block being at least predominantly a polymerized alkenyl arene block, and

(ii) at least one selectively hydrogenated polymer block B, said B block prior to hydrogenation being at least predominantly a polymerized conjugated diene block, and

(2) wherein substantially all of said amide functional groups are grafted to said base block copolymer on said A blocks, and

(3) wherein said amide functional groups are represented by the general formula



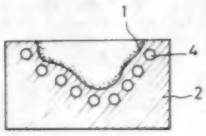
wherein R is an alkyl, cycloalkyl, or aryl radical.

H827

PROCESS FOR MANUFACTURING MOLDED OUTER COVERING

Kouichi Yamagishi, 16-4, Agarito, Furui-cho, Anjyo-shi, Aichi-ken, Japan

Filed May 7, 1985, Ser. No. 731,643
Claims priority, application Japan, May 16, 1984, 59-98383
Int. Cl.[5] B29C *41/22, 69/00*
U.S. Cl. 264—73 8 Claims



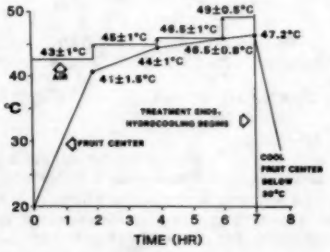
1. A process for manufacturing a molded outer covering, comprising mixing at least two powder resin materials having different colours at a desired mixing ratio to make a single powder mixture, loading the powder mixture in a preheated die, and removing an excess of the powder mixture from the die, and then heating the powder mixture in the preheated molding die to melt the mixture, so that a molded outer covering which has a pepper and salt pattern with different colours on its outer surface is obtained.

H828

HOT AIR DISINFESTATION OF FRUIT AND VEGETABLES

John W. Armstrong, Keaau; Benjamin K. S. Hu, Hilo; Steven A. Brown, Keaau, and James D. Hasen, Keaau, all of Hi., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Nov. 14, 1988, Ser. No. 270,608
Int. Cl.[5] A23L *3/16, 1/212*
U.S. Cl. 426—615 16 Claims



1. A treatment method for disinfesting a fruit or vegetable commodity of a quarantine pest, which comprises heating the commodity in one or more stages with air having a temperature of about 43° to 49° C. and a relative humidity (RH) of 30–80% until the temperature of the commodity exceeds the thermal death point temperature of the pest but does not cause external scalding of the commodity and holding the commodity at this temperature until the pest is killed.

H829

RECHARGEABLE LITHIUM-ORGANIC ELECTROLYTE BATTERY HAVING OVERCHARGE PROTECTION AND METHOD OF PROVIDING OVERCHARGE PROTECTION FOR A LITHIUM-ORGANIC ELECTROLYTE BATTERY

Wishvender K. Behl, Ocean, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jun. 13, 1985, Ser. No. 744,344
Int. Cl.[5] H01M *6/14*
U.S. Cl. 429—194 **3 Claims**

1. A method of providing overcharge protection for a rechargeable lithium-organic electrolyte battery including lithium as the anode, a member of the group consisting of TiS_2, MoO_3, Cr_2O_3, V_2O_5, V_6O_{13}, and V_2S_5 as the cathode, and a solution of a lithium salt selected from the group consisting of lithium perchlorate, lithium hexafluoroarsenate, and lithium tetrachloroaluminate in an organic solvent as the electrolyte, said method comprising including lithium bromide in the electrolyte to prevent the undesirable oxidation of organic solvent during the overcharge of the rechargeable lithium-organic electrolyte battery.

H830

SILVER HALIDE COLOR PHOTOGRAPHIC MATERIAL

Naoyasu Deguchi; Shinji Ueda, and Koki Nakamura, all of c/o Fuji Photo Film Co., Ltd. 210, Nakanuma, Minami Ashigarashi, Kanagawa, Japan

Filed May 2, 1988, Ser. No. 189,071
Claims priority, application Japan, Apr. 30, 1987, 62-104495
Int. Cl.[5] G03C *1/08, 7/26, 7/32*
U.S. Cl. 430—542 **13 Claims**

1. A silver halide color photographic material comprising at least one light-sensitive silver halide emulsion layer on a support, wherein at least one of said emulsion layer and a non-light sensitive hydrophilic layer(s) contains at least one compound represented by the formula (I)

$$\text{PWR—Time—}_t\text{BA} \qquad \text{(I)}$$

wherein PWR represents a group which undergoes reduction to release (Time-$_t$BA; BA represents a group which becomes a desilvering accelerator after being released; Time represents a group which releases BA through a reaction after being released from PWR as (Time—$_t$BA; and t represents an integer of 0 or 1.

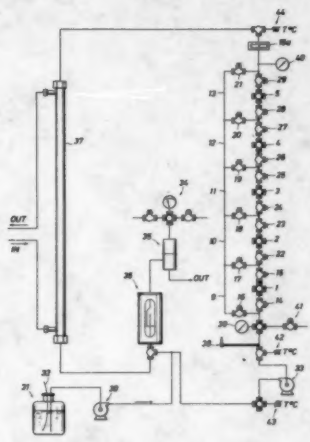
H831

TUBULAR BIOFILM REACTOR

Joseph P. Salanitro, and James S. Hokanson, both of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Continuation of Ser. No. 603,016, Apr. 23, 1984, abandoned.
This application Apr. 20, 1987, Ser. No. 39,851
Int. Cl.[5] C12Q *1/04, 1/24;* C12M *1/32, 1/28*
U.S. Cl. 435—34 **1 Claim**

1. A method for monitoring biofilm microorganisms in a continuous flow stream, comprising (a) connecting biofilm samplers with tubular means, (b) passing a continuous flow stream through the samplers, (c) bypassing the continuous flow



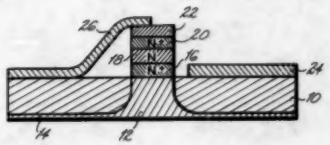
stream around at least one biofilm sampler, and (d) checking the one biofilm sampler for biofouling.

H832

PLANAR MONOLITHIC SELF-OSCILLATING MIXER

Samuel Dixon, Jr., Neptune, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Sep. 15, 1989, Ser. No. 408,848
Int. Cl.[5] H04B *1/26*
U.S. Cl. 455—327 **6 Claims**



1. A planar monolithic self-oscillating mixer for millimeter wave applications comprising:
- a gallium arsenide substrate having a bottom surface and a top surface;
- a via hole extending from said bottom surface to said top surface of said substrate;
- a metal plating on said bottom surface of said substrate and in said via hole;
- a first N^+ gallium arsenide layer disposed above said via hole at said top surface of said substrate;
- a N gallium arsenide layer disposed on said first N^+ gallium arsenide layer;
- a second N^+ gallium arsenide layer disposed on said N gallium arsenide layer;
- said first and second N^+ gallium arsenide layers and said N gallium arsenide layer forming a plateau having an upper surface;
- a radio frequency transmission line disposed on said upper surface of said substrate having one end adjacent to but spaced from said plateau and extending to one edge of said substrate;
- an intermediate frequency transmission line having one end connected to the upper surface of said plateau and extending to an edge of said substrate opposite to said one edge;
- a portion of said intermediate frequency transmission line being disposed on said upper surface of said substrate; and
- a bias line connected to said intermediate frequency transmission line and extending to an edge of said substrate.

REISSUES

OCTOBER 2, 1990

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

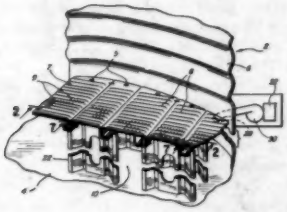
Re. 33,358
DRYING BIN FLOOR

Eugene G. Sukup, Beeds Lake, Hampton, Iowa 50441

Original No. 4,604,842, dated Aug. 12, 1986, Ser. No. 706,489, Feb. 28, 1985. Application for reissue Aug. 11, 1988, Ser. No. 231,222

Int. Cl.[5] **E04B** *1/70*

U.S. Cl. 52—263 **29 Claims**



10. In a bin for storing or drying grain and having a base floor, a supported floor assembly comprising the combination of a plurality of [support posts] *supports* each having a bottom portion positioned on said base floor and each having a top portion spaced from said base floor, [a plurality of hat-shaped] *first and second* panels each having a panel plank portion which is perforate for the passage of air therethrough and [has] *each having* two longitudinal edges, and each of said [hat-shaped] *first and second* panels having an outwardly turned depending channel subjacent to [each] *at least one* of said longitudinal edges, and at least one C-shaped panel having a panel plank portion which is perforate for the passage of air therethrough and has two longitudinal edges, and said C-shaped panel having an inwardly turned depending channel subjacent to each of said longitudinal edges thereof, said outwardly turned channels of each [hat-shaped panel] *of said first and second panels* contacting the top portion of [a plurality of] said [support posts] *supports and extending toward and spaced from one another,* said C-shaped panel being positioned between [a] *said* first and [a] second [of said hat-shaped] panels and having one of said inwardly turned channels thereof in interfitting relation with [an] *said* outwardly turned channel of said first [hat-shaped] panel and the other of said inwardly turned channels thereof in interfitting relation with [an] *said* outwardly turned channel of said second [hat-shaped] panel, and said panel plank portions being contiguous to one another along said longitudinal edges of said panel plank portions, whereby said panels form a generally continuous planar floor surface permitting passage of air therethrough for conditioning grain and said C-shaped panel can be lifted to gain access to the space between said panels and said base floor.

Re. 33,359
PLANING CATAMARAN VESSEL

Thomas G. Lang, 417 Loma Larga Dr., Solana Beach, Calif. 92075

Original No. 4,802,428, dated Feb. 7, 1989, Ser. No. 26,774, Mar. 17, 1987. Application for reissue Aug. 28, 1989, Ser. No. 399,602

Int. Cl.[5] **B63B** *1/00*

U.S. Cl. 114—61 **36 Claims**

1. A catamaran vessel, comprising:

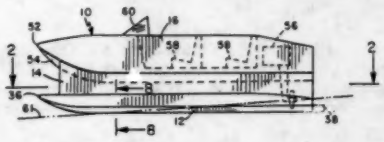
a pair of spaced, parallel elongated pontoons;

at least one strut extending upwardly from each of the pontoons;

each strut having a streamlined nose region and having a width less than that of the attached pontoon;

a superstructure supported on said struts for riding above the waterline; and

each pontoon having a lower planing surface for planing on the water surface at speed and sharp chines at its inner and outer side edges, the cross-sectional width of the pontoon



varying along at least part of its height with the widest point of the cross-section being below the top of the pontoon, *at least a substantial part of* the pontoon lying [at least substantially] below the waterline when the vessel is at rest in the water, and *the pontoon* planing on the water surface with the majority of the pontoon lying above the water line when the vessel travels at speed in the water.

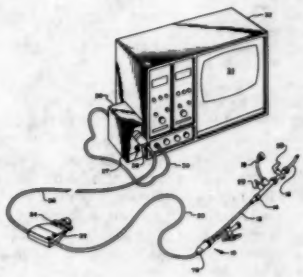
Re. 33,360
DISPOSABLE TRANSDUCER APPARATUS FOR AN ELECTROMANOMETRY SYSTEM

Gordon S. Reynolds, Bountiful; Robert J. Todd, Salt Lake City, both of Utah, and Edward J. Russell, San Jose, Calif., assignors to Abbott Laboratories, Abbott Park, Ill.

Original No. 4,557,269, dated Dec. 10, 1985, Ser. No. 506,753, Jun. 22, 1983. Application for reissue Dec. 10, 1987, Ser. No. 131,161

Int. Cl.[5] **A61B** *5/02*

U.S. Cl. 128—675 **9 Claims**



1. In an electromanometry system for monitoring and recording hemodynamic pressures, a disposable transducer apparatus, said electromanometry system including a catheter coupled through tubing to a source of sterile liquid which is used to fill the tubing and cathether and through which said hemodynamic pressures are mechanically transmitted, said apparatus comprising:

a disposable housing constructed of light weight plastic material, said housing having a transparent chamber with an inlet and outlet, said chamber being connected at said inlet to said tubing;

valve means connected to the outlet of said chamber for

selectively venting the interior of said chamber to the ambient atmosphere;

a pressure sensing element mounted at one end of said chamber; said pressure sensing element comprising a thin-diaphragm piezoresistive strain gauge in the form of a resistive bridge network diffused onto a semiconductor substrate;

a nonconductive gel-like substance contained within said chamber, said nonconductive gel-like substance completely covering said pressure sensing element and transmitting said hemodynamic pressures from said sterile liquid to said pressure sensing element; and

a plurality of disposable calibration resistors electrically connected to said resistive bridge network, said resistors being formed on a semiconductor *or thin film* substrate.

Re. 33,361

SUBSTRATE AND MEDIA CARRIER

Thomas U. Coe, 15217 Sobey Rd., Saratoga, Calif. 95071

Original No. 4,588,086, dated May 13, 1986, Ser. No. 618,189, Jun. 7, 1984. Application for reissue May 12, 1988, Ser. No. 193,396

Int. Cl.[5] **B65D** *85/57*

U.S. Cl. 206—444 **25 Claims**

1. A carrier for substrate and media disk members comprising:

a base member having

a flat peripheral base flange,

upstanding side and end walls connected to said base flange,

a top surface having

a semicylindrical disk supporting recess projecting downwardly toward said peripheral base flange and including a Plurality of continuous semicircular V-shaped grooves each subtending an arc of less than 180 degrees for holding a disk member, and

locating means in said base peripheral flange along only one side wall for locating said carrier in disk handling equipment.

23. A carrier for substrate and media disk members comprising: a substantially rigid base member having upstanding side walls with a top, end walls and a top surface having a semicylindrical disk supporting recess projecting downwardly and including a plurality of continuous semicircular substantially V-shaped grooves; said grooves having a lowermost point and a given minimum semicircular radius; each groove subtending an arc of less than 180 degrees for holding a disk member having a portion substantially conforming to said semicircular grooves; said base member having a width greater than twice the length of said given minimum semicircular radius of said grooves; said top of said side walls having a height above said lowermost point of the said grooves less than the length of said given minimum semicircular radius whereby the disk members can be grasped and lifted at diametrically opposed peripheral portions; said side walls at a base member width greater than twice the length of said given minimum semicircular radius of said grooves and said end walls having means for telescoping attachment of a lid member to enclose disk members within said base member and the lid member.

24. A carrier for substrate and media disk members comprising: a base member having upstanding side walls with a top, end walls and a top surface having a semicylindrical disk supporting recess projecting downwardly and including a plurality of continuous semicircular substantially V-shaped grooves; said grooves having a lowermost point and a given minimum semicircular radius; each groove subtending an arc of less than 180 degrees for holding a disk member having a portion substantially conforming to said semicircular grooves; said top of said side walls having a height above said lowermost point of said grooves less than the length of said given minimum semicircular radius whereby the disk members can be grasped and lifted at diametrically opposed peripheral portions and a lid member having side and end walls, respectively, telescoping with side and end walls of said base member and means inside said lid member for holding each disk held by said base member.

25. A carrier for substrate and media disk members comprising: a base member having upstanding side walls with a top, end walls and a top surface having a semicylindrical disk supporting recess projecting downwardly and including a plurality of continuous semicircular substantially V-shaped grooves; said grooves having a lowermost point and a given minimum semicircular radius; each groove subtending an arc of less than 180 degrees for holding a disk member having a portion substantially conforming to said semicircular grooves; said top of said side walls having a height above said lowermost point of said grooves less than the length of said given minimum semicircular radius whereby the disk members can be grasped and lifted at diametrically opposed peripheral portions and a lid member having side and end walls, respectively, telescoping with side and end walls of said base member, means inside said lid member for holding each disk held by said base member and cooperating engaging means on said base member and said lid member whereby said base member and lid member are stackable in pairs one on top of another.

Re. 33,362

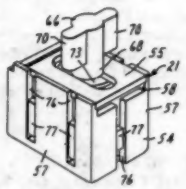
BONE STAPLER CARTRIDGE

Douglas R. Mongeon, Orange, Calif., and Edward P. Skwor, Savage, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Original No. 4,569,469, dated Feb. 11, 1986, Ser. No. 701,970, Feb. 15, 1985. Application for reissue Feb. 11, 1988, Ser. No. 157,439

Int. Cl.[5] **A61B** *17/00*

U.S. Cl. 227—19 **10 Claims**



7. A cartridge adapted for use in a stapler for driving generally U-shaped staples each comprising a central portion and two generally parallel leg portions projecting generally in the same direction from opposite ends of its central portion and having distal ends, which stapler comprises a housing having a passageway extending from an inlet opening to an outlet opening, the passageway being adapted to guide a single staple moved from the inlet to the outlet opening with the distal ends of its legs leading; a driver having an

end portion adapted to engage the central portion of the staple and being mounted on the housing for sliding movement between a load position with the driver spaced from the inlet opening to afford movement of one of the staples into the passageway, along the passageway with the end portion pushing the staple, to an eject position at which the end portion of the driver pushes the staple out the outlet opening; and drive means adapted to be manually activated for propelling the driver along the passageway from the load to the eject position to move the staple from the inlet to the outlet opening, the housing including a support wall having an inner surface defining a socket adapted to receive said cartridge at the inlet opening, the support wall also having an outer surface and a through opening between the inner and outer surfaces, said cartridge including:

a case comprising a guide wall defining an inner surface and side walls projecting generally normal to said inner surface, said side walls having opposed transverse openings at said inner surface, said guide wall being adapted to be received in the socket with said inner surface defining a portion of the passageway at the inlet opening and said transverse openings aligned with the passageway so that the driver can be moved through said transverse openings and along said inner surface between the load and eject positions;

a stack of staples within said case;

a follower on the side of said stack of staples opposite said inner surface and movable within said case with said stack of staples;

a spring for biasing said follower and said stack of staples toward said inner surface; and

retaining means adapted for releasably retaining said case in engagement with the housing, said retaining means comprising a spacing portion having an axis, having an end mounted on said case, projecting axially and generally centrally away from said case on the side of said guide wall opposite said inner surface at generally a right angle to said inner surface for a first predetermined distance about equal to the distance between the inner and outer surfaces of the support wall, and being adapted to be positioned within the through opening; a locking portion projecting axially beyond said spacing portion and having an engagement surface adjacent said guide wall adapted to engage the second surface of the support wall; and means adapted for releasably positioning said spacing portion in the through opening and said engagement surface on said locking portion along the outer surface of the support wall to hold said cartridge on the housing of the stapler.

Re. 33,363

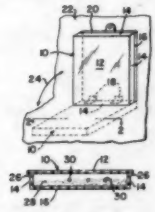
MAGNETIC TRACING APPARATUS

Sidney H. Miller, 850 E. Louther St., Carlisle, Pa. 17413

Original No. 4,804,327, dated Feb. 14, 1989, Ser. No. 151,543, Feb. 2, 1988. Application for reissue May 9, 1989, Ser. No. 351,083

Int. Cl.[5] **G09B** *19/00*

U.S. Cl. 434—409 **73 Claims**



46. A tracing apparatus comprising in combination, an enclosure of geometric configuration and having at least one transparent surface area, said enclosure containing pulverulent nonmagnetic particles disposed to adhere to the inner surface of said area admixed with magnetically attractive fragments, and a permanent magnetic tracing device slidably movable over the outer surface of said area of said enclosure and attracting certain of said magnetically attractive fragments toward said device as it is moved over said area and cause the magnetically attractive fragments attracted thereto to move along the inner surface of said enclosure and remove from said inner surface a pattern of said nonmagnetic particles to form a design image where the attracted fragments removed the nonmagnetic particles from the inner surface of said surface area, said permanent magnetic tracing device having a manually-engageable handle to which a permanent magnet is fixed with the magnet axis of orientation coaxial with said handle and affixed to one end thereof, whereby the magnetic force of said magnet is applicable when the device is between a perpendicular relation to the drawing area and up to 30 degrees from perpendicular.

Re. 33,364

NON-AROMATIC OXYGENATED STRONG ACID DEHYDRATION OF 9α-HYDROXYANDROSTENEDIONES

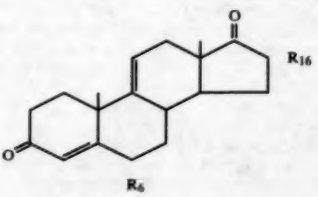
John M Beaton, Portage; Joel E. Huber, Kalamazoo; Amphlett G. Padilla, and Max E. Breuer, both of Portage, all of Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Original No. 4,127,596, dated Nov. 28, 1978, Ser. No. 786,127, Apr. 11, 1977. Application for reissue Apr. 14, 1988, Ser. No. 181,752

Int. Cl.[5] **C07J** *1/00*

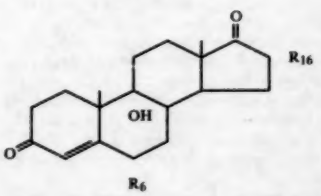
U.S. Cl. 552—640 **23 Claims**

1. A process for the preparation of a steroid of the formula:



II

where R_6 is a hydrogen or fluorine atom, or a methyl group; R_{16} is a hydrogen atom or methyl group and where ~ indicates that the attachment of the R_6 and R_{16} groups are in the α or β configuration which comprises reacting a 9α-hydroxy steroid of the formula:



I

where R_6, R_{16}, and ~are defined above with a nonaromatic oxygenated acid with a pK_a of less than or equal to 1.0.

2. A process according to claim 1 where the acid is selected from the group consisting of chlorosulfonic, sulfuric, [phosphoric,] methanesulfonic, perchloric and trifluoroacetic.

Re. 33,365

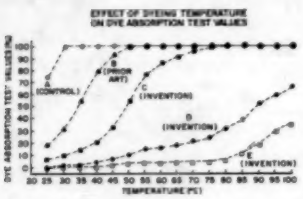
STAIN RESISTANT NYLON FIBERS

Randolph C. Blyth, Gulf Breeze, and Pompelio A. Ucci, Pensacola, both of Fla., assignors to Monsanto Company, Pensacola, Fla.

Original No. 4,680,212, dated Jul. 14, 1987, Ser. No. 914,507, Oct. 2, 1986. Continuation of Ser. No. 834,804, Mar. 6, 1986, abandoned, which is a continuation-in-part of Ser. No. 643,606, Aug. 23, 1984, abandoned, which is a continuation of Ser. No. 562,370, Dec. 16, 1983, abandoned. Application for reissue Aug. 21, 1989, Ser. No. 396,260

Int. Cl.[5] B32B *27/34*

U.S. Cl. 428—97 27 Claims



1. An undyed stained resistant nylon fiber characterized by having a coating on the surface thereof comprising one or more stain blockers in an amount sufficient to provide a fiber having a dye absorption test value at 25° C. of [no greater than 7%] *substantially zero* and a dye absorption value at 100° C. of no less than 30%.

Re. 33,366

RIGID, WATER-RESISTANT PHOSPHATE CERAMIC MATERIALS AND PROCESS FOR PREPARING THEM

Jeffery L. Burrall, Lancaster, Pa., assignor to Armstrong World Industries, Inc., Lancaster, Pa.

Original No. 4,375,516, dated Mar. 1, 1983, Ser. No. 378,522, May 18, 1982. Continuation-in-part of Ser. No. 351,753, Mar. 2, 1982, abandoned, which is a continuation-in-part of Ser. No. 274,156, Jun. 16, 1981, abandoned. Application for reissue Oct. 6, 1988, Ser. No. 253,819

Int. Cl.[5] C04B *21/00*

U.S. Cl. 501—84 80 Claims

20. A process for manufacturing rigid, water resistant phosphate ceramic material, said process comprising the steps of:

preparing a mixture comprising [from about 11 to about 65 parts by weight calculated on an anhydrous basis of] at least one metal oxide selected from the group consisting of Al_2O_3, MgO, CaO, or ZnO or the hydrates thereof and about 100 parts by weight of calcium silicate,

preparing a reaction solution comprising *at least one metal oxide from the group consisting of Al_2O_3, MgO, CaO, or ZnO or the hydrates thereof and* from about 80 to about 190 parts by weight of a phosphoric acid solution comprising the equivalent of from about 35 to about 75% by weight of phosphorus pentoxide based on the weight of the acid solution, the water of hydration of said metal oxide being included when calculating the phosphorus pentoxide content, *the total of metal oxide in said mixture and in said reaction solution being from about 11 to about 65 parts by weight calculated on an anhydrous basis,*

adjusting the temperature of said reaction solution to a desired value,

proportionally intermixing said mixture with said reaction solution, and

placing the resulting intermixed material in a desired configuration and allowing the compounds thereof to interact,

the temperature of the reaction solution being selected so as to approximately predetermine the point in time at which said intermixed material becomes rigid relative to the point in time at which vaporization of the water occurs.

Re. 33,367

POLYETHER POLYMER OR COPOLYMER, MONOMER THEREFOR, AND PROCESS FOR PRODUCTION THEREOF

Katsuhito Miura, Amagasaki, and Tetsuya Nakata, Ibaraki, both of Japan, assignors to Osaka Soda Co., Ltd., Osaka, Japan

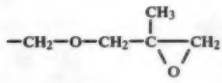
Original No. 4,711,950, dated Dec. 8, 1987, Ser. No. 925,270, Oct. 31, 1986. Application for reissue Jun. 9, 1988, Ser. No. 204,563

Claims priority, application Japan, Nov. 5, 1985, 60-247712; Dec. 10, 1985, 60-278560; Jan. 20, 1986, 61-10763

Int. Cl.[5] C08G *24/02, 59/32*

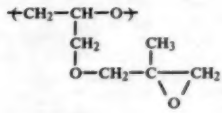
U.S. Cl. 528—409 7 Claims

1. A polyether polymer or copolymer with a pendant group of the formula



in its molecule, said polymer or copolymer consisting essentially of

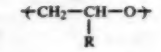
(1) [1] *5* to 100 mole % of recurring units represented by the following formula (I)



(I)

and

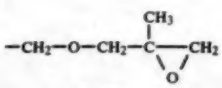
(2) [0 to 99] *0 to 95* mole % of at least one type of recurring units represented by the following formula (II)



(II)

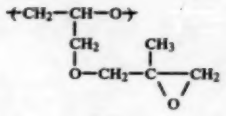
wherein R represents a member selected from the class consisting of a hydrogen atom, substituted or unsubstituted C_1–C_{18} alkyl groups, substituted or unsubstituted C_2–C_{18} alkenyl groups, substituted or unsubstituted C_3–C_8 cycloalkyl groups and substituted or unsubstituted C_6–C_{14} aryl groups, and having a reduced viscosity η_{red}, determined at 45° C. in its 0.1% benzene solution or at 80° C. in its 0.1% monochlorobenzene solution, of at least 0.01.

7. A polyether copolymer with a pendant group of the formula



in its molecule, said copolymer comprising

(1) from 1 to 99 mole percent of recurring units of formula (I)



(I)

and

(2) from 1 to 99 mole percent of at least one recurring unit derived from a monoepoxy compound selected from the group consisting of glycidyl acetate, glycidyl propionate, glycidyl benzoate, glycidyl cinnamate and glycidyl naphthonate, said copolymer having a reduced viscosity η_{red} determined at 45° C. in its 0.1% benzene solution or at 80° C. in its 0.1% monochlorobenzene solution, of at least 0.01.

Re. 33,368

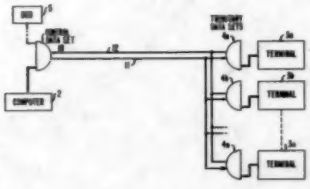
DATA SET NETWORK DIAGNOSTIC SYSTEM

Donald W. Darling, Metuchen; Thomas M. Dennis, Ocean; Stevan J. Thayer, Freehold, and Bonnie A. Zimmer, Howell, all of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Original No. 4,398,299, dated Aug. 9, 1983, Ser. No. 196,160, Oct. 10, 1980. Application for reissue Aug. 5, 1985, Ser. No. 762,761

Int. Cl.[5] H04B *1/38*

U.S. Cl. 375—8 **39 Claims**



24. A network diagnostic device for use in a data communication system comprised of a first data processing device which communicates with a plurality of terminal data processing devices via a control data set adapted to transmit data from said first device to each terminal device via a communication link associated with said each terminal device and a tributary data set associated with said each terminal device, and each tributary data set being adapted to transmit data from the associated terminal device to said first device via the associated link and said control data set, said network diagnostic device including

means for transmitting to at least one of the tributary data sets via the associated link at least a first downstream text identifying a test to be initiated by said one tributary data set, and

means for initiating at least a first test in response to an upstream text identifying said at least first test transmitted to said network diagnostic device by said one tributary data set via the associated link.

Re. 33,369

REMOTE CONTROL DEVICE USING TELEPHONE CIRCUIT OF ELECTRIC APPARATUS

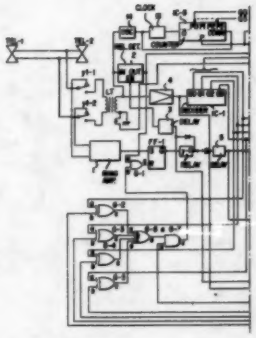
Kazuo Hashimoto, Tokyo, Japan, assignor to Hashimoto Corporation, Tokyo, Japan

Original No. 4,540,851, dated Sep. 10, 1985, Ser. No. 567,869, Jun. 5, 1982. Application for reissue Aug. 17, 1987, Ser. No. 88,044

Claims priority, application Japan, Jun. 5, 1982, 57-96794; Apr. 9, 1983, 58-62562; Sep. 2, 1983, 58-161705

Int. Cl.[5] H04M *11/00*

U.S. Cl. 379—104 **15 Claims**



9. An electric apparatus comprising: a remote control device; a tone decoder for converting to a code a remote control signal generated by various buttons of the remote control device; selecting means for selecting a desired operation mode of said electric apparatus in accordance with an output from said tone decoder corresponding to a remote control signal generated by numeric buttons of said remote control device; start time preset means for presetting a future start time of said electric apparatus in accordance with the number of outputs generated by said tone decoder which correspond to a remote control signal generated by a specific button (e.g., "#") other than the numeric buttons of said remote control device (e.g., each pressing of the specific button corresponds to thirty minutes); and operation time duration preset means for presetting the operation time duration after the start time of said electric apparatus in accordance with the number of outputs generated from said tone decoder which correspond to a remote control signal generated by a further button (e.g., "") other than the numeric buttons and the specific button of said remote control device (e.g., each pressing of the further button corresponds to a thirty minutes duration).*

PLANT PATENTS

GRANTED OCTOBER 2, 1990

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

7,340

ROSE PLANT NAMED 'TIPPER'

Marie Jolly, Gregg Neck Rd., Galena, Md. 21635

Filed Aug. 2, 1989, Ser. No. 388,698
Int. Cl.[5] A01H *5/00*
U.S. Cl. Plt.—9 1 Claim

1. A new and distinct variety of rose plant of the miniature rose class, substantially as shown and described, characterized particularly by clear coral pink well formed blooms that hold their color throughout the life of the flower.

7,341

ROSE PLANT — KEIJOURNA VARIETY

Seizo Suzuki, Tokyo, Japan, assignor to The Conard-Pyle Company, West Grove, Pa.

Filed Jun. 14, 1989, Ser. No. 365,823
Int. Cl.[5] A01H *5/00*
U.S. Cl. Plt.—21 1 Claim

1. A new and distinct variety of Hybrid Tea rose plant characterized by the following combination of characteristics:

(a) forms in abundance attractive very large double blossoms which are vermilion red on the upper surface and cardinal red on the under surface and exhibit a long vase life,
(b) exhibits an erect growth habit,
(c) is well suited for cut flower production in a greenhouse,
(d) form vigorous vegetation, and
(e) exhibits good resistance to cryptogamic diseases;
substantially as herein shown and described.

7,342

DISTINCT VARIETY OF ORANGE NAMED BARNFIELD LATE NAVEL

Wayne M. Barnfield, via Wentworth, Australia, assignor to Delwyn Barnfield, Ellerslie via Wentworth, Australia

Filed Dec. 7, 1988, Ser. No. 281,799
Claims priority, application Australia, Dec. 7, 1987, 82169/87
Int. Cl.[5] A01H *5/00*
U.S. Cl. Plt.—45 1 Claim

1. A new and distinct variety of Naval orange named Barnfield Late Navel, as illustrated and described, and particularly characterized by its late maturation, and very late hanging of fruit.

7,343

REGAL PELARGONIUM 'CRYSTAL'

Richard Craig, State College, Pa., and Glenn G. Hanniford, Worthington, Ohio, assignors to Research Corporation Technologies, Inc., Tucson, Ariz.

Filed Apr. 10, 1989, Ser. No. 337,782
Int. Cl.[5] A01H *5/00*
U.S. Cl. Plt.—68 1 Claim

1. A new and distinct cultivar of regal Pelargonium substantially as illustrated and described herein, particularly characterized as being compact and self-branching, early flowering and floriferous, exhibiting excellent postharvest keeping quality, and having white flowers with distinctive red feathering on the upper two petals thereof.

7,344

BERGENIA "BRESSINGHAM RUBY"

Alan H. Bloom, and Adrian J. Bloom, both of Diss, England, assignors to Blooms of Bressingham Ltd., Bressingham, England

Filed Jul. 28, 1989, Ser. No. 386,182
Int. Cl.[5] A01H *5/00*
U.S. Cl. Plt.—68 1 Claim

1. A new and distinct hybrid of Bergenia substantially as shown and described, characterized by:
an attractive and unique winter foliage color; with leaves turning to a deep brown in winter followed by a burgundy red color in late winter.

7,345

IMPATIENS PLANT NAMED JASIUS

Ludwig Kientzler, Gensingen, Fed. Rep. of Germany, assignor to Paul Ecke Ranch, Encinitas, Calif.

Filed Aug. 16, 1989, Ser. No. 394,770
Int. Cl.[5] A01H *5/00*
U.S. Cl. Plt.—68 1 Claim

1. A new and distinct cultivar of Impatiens plant named Jasius, as illustrated and described.

7,346

CHRYSANTHEMUM PLANT NAMED PASADENA

Cornelis P. VandenBerg, Salinas, Calif., assignor to Yoder Brothers, Inc., Barberton, Ohio

Filed Aug. 2, 1989, Ser. No. 388,896
Int. Cl.[5] A01H *5/00*
U.S. Cl. Plt.—74 1 Claim

1. A new and distinct Chrysanthemum plant named Pasadena, as described and illustrated.

PATENTS

GRANTED OCT. 2, 1990

ERRATA

For CLASS	See PATENT NO.
290-040	4,959,896
052-002	4,959,901
053-252	4,959,936
273-148	4,960,117
144-349	4,960,137
137-625	4,960,139
181-106	4,960,181
206-456	4,960,224
273-032	4,960,239
366-080	4,960,328
425-006	4,960,351
437-003	4,960,436
427-423	4,960,458
419-063	4,960,459
423-027	4,960,461
202-263	4,960,499
560-026	4,960,543
524-099	4,960,593
429-192	4,960,655
505-001	4,960,760
502-154	4,960,761
424-001	4,960,815
524-600	4,960,824
524-494	4,960,826
585-010	4,960,875
556-179	4,960,878
514-721	4,960,884
524-706	4,960,915
392-485	4,960,976
307-201	4,961,002
340-554	4,961,039
313-561	4,961,040
358-038	4,961,099
368-156	4,961,119
324-446	4,961,147
367-142	4,961,181
369-124	4,961,182
369-275	4,961,183
357-022	4,961,194
375-045	4,961,196

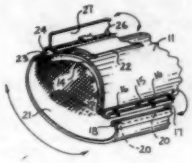
378-181 4,961,213
378-197 4,961,214
380-021 4,961,221

PATENTS

GRANTED OCTOBER 2, 1990

GENERAL AND MECHANICAL

4,959,875
LIMB PROTECTOR DEVICE
Theodore L. Moon, 713 Cusic St., Lake Charles, La. 70605
Filed Mar. 29, 1989, Ser. No. 330,351
Int. Cl.[5] A41D *13/00*
U.S. Cl. 2—22 **11 Claims**



1. A limb protection device for securement about a limb of an individual comprising,

an arcuate elongate shield including a padding laminated to and coextensive with a convex interior surface of said shield,

and

said shield further defined by a first elongate edge parallel to and spaced from a second elongate edge,

and

an anchor member secured coextensively with and adjacent the second edge is secured to an exterior surface of said shield to receive a clip member,

and

said clip member secured to a first end of a securement band,

and

a second free end of the securement band receivable within a clamp secured coextensively with and adjacent to the first edge of the shield on the exterior surface of the shield.

4,959,876
FIREMAN'S COAT
Shaik M. Kalaam, and Gary W. Hughson, both of Scarborough, Canada, assignors to Safeco Mfg. Limited, Scarborough, Canada
Filed Nov. 13, 1989, Ser. No. 434,304
Int. Cl.[5] A41D *1/02, 13/00*
U.S. Cl. 2—93 **3 Claims**

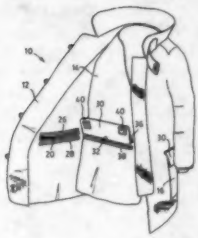
1. In a fireman's coat of the type which has an outer coat portion that forms an outer shell and an inner coat portion that forms a detachable liner for the outer shell, the outer coat portion having side pockets formed in opposite sides thereof, each side pocket having an open end that extends in a front to back direction, the improvement of;

(a) visible indicator means on each side of the outer coat in close proximity to the open end of each pocket, said indicator means extending in a front to back direction and having a sufficient extent to be clearly visible from the front, back and sides of the outer coat when the coat is worn by a fireman in use,

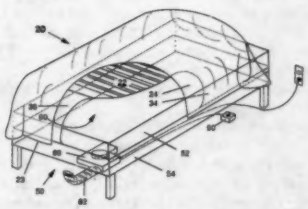
(b) a narrow opening formed in each side of the outer coat in close proximity to the open end of the pocket which is formed therein such that a narrow opening is associated with each pocket,

(c) a pocket flap attached to each side of the inner coat portion, each pocket flap being arranged so that it can extend through one of the narrow openings formed in the sides of the outer coat,

(d) attachment means for securing each pocket flap in an outwardly overlying relationship with respect to the outer coat to close the open end of its associated pocket and to overlie and obscure the visible indicator means associated therewith to clearly indicate that the liner is located in the outer shell in use.



4,959,877
ALL-SEASON FLOATING BLANKET
Donald M. Covil, P.O. Box 2382, Shallotte, N.C. 28459
Filed Nov. 24, 1989, Ser. No. 440,717
Int. Cl.[5] A47C *21/00*; A47G *9/00*
U.S. Cl. 5—423 **1 Claim**



1. A bed covering system comprising a bed cover which can be elevated above a bed comprising a mattress and a box spring, thus creating a cavity between the bed cover and the bed, said cavity being formed as a result of higher air pressure within the cavity as compared to the air pressure outside the cavity, comprising:

(a) upper and lower fabric layers defining channels therebetween, said layers selectively connected together to form an air transportation and distribution network, wherein air is transported through the channels of said network and

thence through the lower fabric layer, thus creating the higher air pressure under the bed cover as compared to the air pressure above the bed cover, the cavity being of a sufficient size to substantially enclose the user(s) of the cover, the lower fabric layer of the cover, having peripheral extensions adapted to be tucked between the mattress and the box spring supporting said mattress, the lower fabric layer including an opening closable by fastening means, said opening adapted to permit the user's entry into, and exit from the cavity,

(b) an air blower, and

(c) means for connecting said air transportation and distribution network to said blower.

4,959,878

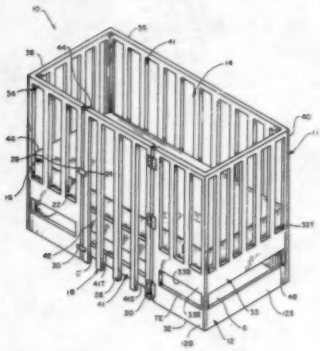
INVALID BED

Christine Essek, 4733 W. Main Rd., Fredonia, N.Y. 14063

Filed Jul. 11, 1989, Ser. No. 377,957

Int. Cl.[5] A61G *7/00*

U.S. Cl. 5—424 **5 Claims**



1. An invalid bed comprising:

A) a monolithic, one-piece base unit which includes

(1) a support section having a bottom which rests on a floor and extends upwardly therefrom and which includes a door opening section defined therein, said support section enclosing a patient containing area,

(2) a vertical rail section immovably fixed to said support section and extending in use upwardly from said support section to a top edge and having a height as measured from said support section to said top edge of at least about thirty-six inches and including a door opening section which is located adjacent to said support section door opening section, said vertical rail section completely surrounding and enclosing said patient containing area,

(3) a mattress supporting section on said supporting section,

(4) a bottom rail which engages the floor and includes a top edge and an outer surface, and

(5) a mid rail which includes a top edge and a bottom edge which is spaced above said bottom rail top edge to define a gap between said bottom rail and said mid rail, an outer surface which is co-planar with said bottom rail outer surface, said vertical rail section extending upward from said mid rail top edge;

B) a bottom strut having a top edge and which includes an outer surface that is spaced from said bottom rail outer surface;

C) a mid strut extending adjacent to said mid rail and spaced from said bottom strut to define a gap therewith; and

D) a door unit attached to said base unit and including

(1) a monolithic, one-piece door element having a top which is co-planar with said vertical rail section top edge and a bottom which is located adjacent to the floor, said door element being mounted on said base unit to swing about a vertically oriented pivot to cover and uncover said vertical rail section door opening section and said support section door opening section, said door unit including a plurality of vertically oriented, horizontally spaced apart rails,

(2) a plurality of hinges attaching said door element to said base unit, each of said hinges being attached to said vertical rail section and said hinges being spaced apart vertically with one hinge being located adjacent to the floor, a second hinge being located adjacent to said vertical rail section top edge, and a third hinge being located between said first hinge and said second hinge, and

(3) two lock assemblies for locking said door element to said base unit, with one lock assembly being located adjacent to said door element bottom and a second lock assembly being located between said door element top and said door element bottom.

4,959,879

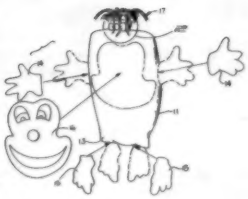
METHOD OF AESTHETICALLY DISGUISING A PILLOW

Joanne G. Marxhausen, 1530 Concordia, Irvine, Calif. 92715

Filed Jun. 1, 1989, Ser. No. 360,139

Int. Cl.[5] A47G *9/00*; A63H *3/00*

U.S. Cl. 5—434 **4 Claims**



1. A method of aesthetically disguising a pillow comprising the steps of,

providing an elongate, flexible sheath and forming the sheath with an upper terminal end and a closed lower terminal end, and

securing plural groups of attachments to an exterior surface of the sheath to disguise the appearance of the sheath, and

inserting a single, continuous pillow within the sheath, and

subsequently gathering the open upper end of the sheath together, and

providing a flexible band, and

securing the flexible band to the gathered upper end of the sheath adjacent the upper terminal end of the sheath, and

wherein the step of securing plural groups of attachments to the exterior surface of the sheath further includes the step of securing a plurality of lower appendages to the lower end of the sheath and securing a plurality of upper appendages to a side surface of the sheath and further securing the upper appendages aligned with one another and on opposed sides of the sheath.

4,959,880

PILLOW HAVING A REMOVEABLE INSERT

Günter Tesch, Avenue Jean-Marie-Musy 15, Fribourg, Switzerland (CH-1700)

Continuation of Ser. No. 174,969, Mar. 29, 1988, abandoned. This application Sep. 15, 1989, Ser. No. 407,955

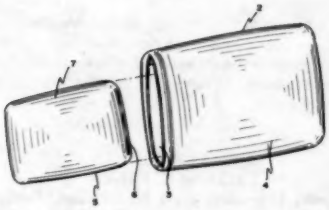
Claims priority, application Switzerland, Apr. 7, 1987, 134187

Int. Cl.[5] A47C *20/02*

U.S. Cl. 5—434 **6 Claims**

1. A pillow comprising a casing having at least one closeable

opening which provides access to an inner area of said casing, filler materials in said inner area comprised to loose, individual filling elements and an insert, said insert comprising a container having at least one closeable opening which provides access to an inner area of the insert, said inner area of said insert containing sufficient loose, individual filling elements to produce an insert having a higher density than the inner area of said casing, said insert being removable from said casing such that the individual filling elements in said insert may be transferred to the inner area of said casing and vice-versa in order to adjust the firmness of said pillow.



4,959,881

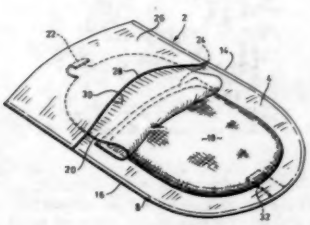
CLEANING MITT

Ellen E. Murray, 239 Pine Drive, Barrie, Ontario, Canada (L4N 4H6)

Continuation of Ser. No. 292,943, Jan. 3, 1989, abandoned. This application Mar. 8, 1990, Ser. No. 492,410

Int. Cl.[5] A47L *1/15*

U.S. Cl. 15—227 **6 Claims**



1. A cleaning mitt assembly comprising:

(a) a mitt having a hand compartment formed therein which is proportioned to accommodate the hand of the user with a proximal end through which an access passage opens into the hand compartment and a distal end remote from the promixal end, said mitt having a front face;

(b) a cleaning pad mounted on the front face of said mitt, said cleaning pad being of a size that is smaller than the area of the front face of said mitt;

(c) a pad sealing cover releasably secured to the front face of the mitt in close proximity to the cleaning pad, said cover being arranged to cooperate with the front face of the mitt to form an enclosure about the cleaning pad, said cover being removable from its position covering the cleaning pad to expose the cleaning pad in use; and,

(d) an outer pocket located at the proximal end thereof which opens toward said distal end, said outer pocket being proportioned to accommodate the said pad sealing cover after removal of the cover from its position covering the cleaning pad.

4,959,882

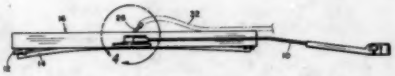
WINDSHIELD WIPER WEATHERSHIELD AND SPRAYER

Donald L. Henderson, 5553 S. Peoria, Suite 104, Tulsa, Okla. 74105, and Elden O. Henderson, Jr., 532 E. Curtis, Midwest City, Okla. 73110

Filed Nov. 21, 1988, Ser. No. 274,363

Int. Cl.[5] B60S *1/46*

U.S. Cl. 15—250.04 **11 Claims**



5. A combination of a windshield cleaning device with a fluid pump which comprises:

a wiper arm;

a wiper blade holder supported by said wiper arm;

a wiper blade supported by said wiper blade holder;

a housing having a top, two sides and two ends with an open bottom said top of said housing is provided with a plurality of ports and a downwardly sloping baffle with each said port;

a two-way nozzle centrally located within said housing, one nozzle directed toward one end of said housing and the other toward the other end of said housing;

hose means connecting said two way nozzle to said pump; and

means to secure said housing to said wiper blade holder.

4,959,883

WINDSHIELD WIPER DEPLOYMENT SYSTEM USING THE WIPER MOTOR

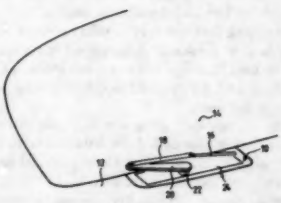
Jean-Pierre Enstache, Antony, France, assignor to Valeo Systemes d'Essuyage, Montigny-Le-Bretonneux, France

Filed May 8, 1990, Ser. No. 520,503

Claims priority, application France, May 9, 1989, 89 06060

Int. Cl.[5] B60S *1/02, 1/26, 1/36*

U.S. Cl. 15—250.35 **7 Claims**



1. A windshield wiper installation comprising a support plate, a wiper motor carried on the support plate, a first drive spindle mounted rotatably on the support plate, means coupling the first drive spindle with the motor for driving the former in a wiping movement, a blade carrier support arm fixedly carried by the first drive spindle, a blade carrier articulated to the support arm, a wiper blade carried by the blade carrier, and a deployment mechanism at least partly carried by the support arm and coupled with the blade carrier for deploying the latter from, and for folding it back against, the former, wherein the installation further comprises at least two couplings releasably coupling the deployment mechanism with the wiper motor, whereby the deployment and folding back of the blade carrier can be actuated by the wiper motor without a wiping action in one condition of the said couplings, with, in an opposite condition thereof, the deployment mechanism disconnected so that the wiper motor can actuate a wiping operation.

4,959,884

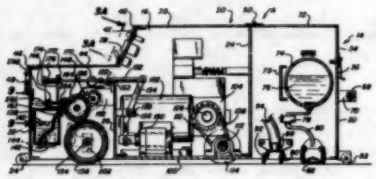
COMBINATION BOWLING LANE STRIPPER AND DRESSING APPARATUS

Donald E. Ingermann, Arvada; Ronald L. Smith, Boulder; Stephen F. Caffrey, Arvada, and Lonney J. Steinhoff, Evergreen, all of Colo., assignors to Century International Corporation, Golden, Colo.

Continuation-in-part of Ser. No. 371,295, Jun. 29, 1989, Pat. No. 4,920,604. This application Apr. 16, 1990, Ser. No. 509,243

Int. Cl.[5] A47L *11/282*

U.S. Cl. 15—302 **12 Claims**



1. A combination bowling lane stripper and dressing apparatus comprising:

a carriage for movement along a bowling alley from a foul line to the pit and back again, said carriage having a forward portion and a rearward portion;

a reversible drive mechanism connected to said carriage and having a drive shaft and surface-engaging drive wheels mounted on said drive shaft operative to advance said carriage along a predetermined course in a forward and reverse direction;

cleaner applicator means extending transversely of said carriage in said forward portion and mounted for movement with respect thereto between an operative lane-engaging position and a retracted position within said carriage and above the lane;

a cleaner reservoir;

means for supplying cleaner from said reservoir to said applicator, said cleaner supplying means having a fluid valve for permitting the flow of cleaner to said applicator when open and prohibiting flow of cleaner to said applicator when closed;

a vacuum means for removing cleaner and dirt from the surface of the lane, said vacuum means having a vacuum head extending transversely of said carriage rearwardly of said applicator means and mounted for movement with respect to said carriage between an operative lane-engaging position and a retracted position within said carriage and above the lane;

lane-buffing means including a roller and drive therefore, said roller being journalled for rotation with its surface in lane-contacting relation about a horizontal axis extending transversely of the direction of travel;

lane-dressing means detachably connectable to said lane buffing roller including a reservoir for the storage of a lane-dressing fluid and fluid transfer means, said fluid transfer means being selectively operative to transfer fluid therefrom to said surface of said lane-buffing roller;

power supply means in said carriage;

control means connected to said power supply means responsive to control signals to selectively activate and deactivate each function of said stripper;

an on-off switch which can be closed for activating said drive mechanism so that said carriage travels in a forward direction from the foul lane to the pit;

first means responsive to said control means for opening said fluid valve during at least a portion of said forward travel;

second means responsive to said control means for moving said applicator into said lane-engaging position;

third means responsive to said control means for moving said vacuum head into said lane-engaging position;

fourth means responsive to said control means for causing said fluid transfer means to be operative to transfer dressing fluid from said reservoir to said surface of said lane-buffing roller;

fifth means responsive to said control means to cause said fluid transfer means to become inoperative;

sixth means responsive to said control means for deactivating said first and second responsive means to shut-off said fluid valve and to move said applicator to said retracted position; and

a limit switch responsive to said carriage reaching the pit to cause said control means to deactivate said drive mechanism to stop said carriage and to deactivate said third responsive means to raise said vacuum head to said retracted position.

4,959,885

VACUUM CLEANER

John F. Sovis, Twinsburg; Craig M. Saunders, Rocky River; James J. Kopco, Richmond Heights, and Michael F. Wright, Cuyahoga Falls, all of Ohio, assignors to Royal Applicance Mfg. Co., Cleveland, Ohio

Filed Jan. 12, 1990, Ser. No. 464,203

Int. Cl.[5] A47L *5/32*

U.S. Cl. 15—335 **20 Claims**

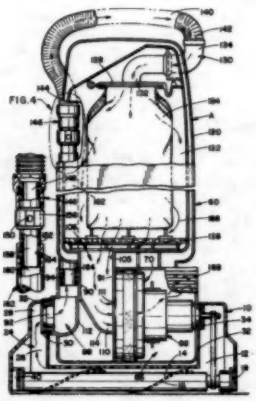


FIG.4

1. A convertible vacuum cleaner comprising:

a nozzle base movable along a floor surface and including a brush chamber for mounting a rotatable brush and a first suction passage communicating with said brush chamber at one end and with an exterior periphery of said nozzle base at the other end;

a motor and filter housing rotatably mounted on said nozzle base, said housing comprising:

a second suction passage communicating at a first end with said first suction passage second end and at a second end with an exterior periphery of said motor and filter housing,

a motor chamber formed in said motor and filter housing in spaced relation to said second suction passage, and

a suction chamber disposed in said motor and filter housing in a spaced manner from said second suction passage and said motor chamber, said suction chamber having an inlet port communicating with said exterior periphery of said motor and filter housing; and,

a flexible hose mounted on the vacuum cleaner, said hose having a first end, communicating with said second suction passage second end, and a second end communicating with said suction chamber inlet port, wherein said flexible hose first end can be selectively removed from communi-

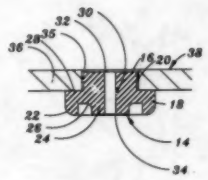
cation with said second suction passage to enable the vacuum cleaner to be used with associated cleaning tools.

4,959,886

CONSTRUCTION FORM PLUG FOR NAIL

Harold D. Dinges, 302 N. Taylor, Pleasant Hill, Mo. 64080

Filed Sep. 11, 1989, Ser. No. 405,304
Int. Cl.[5] E04B *1/62*; E04D *3/36*
U.S. Cl. 16—2 **1 Claim**



1. A construction form plug for engagement with a construction form presenting a hole for insertion therein and for receiving a fastening member axially therethrough comprising:

a plug end presenting a substantially cylindrical sidewall and a substantially planar top end, said plug end having a diameter to height ratio of about three to one, said cylindrical sidewall presenting a circumscribing rib extending radially outwardly therefrom, said rib being located on said plug end and complimentarily sized with said hole for insertion therein with said rib in engagement with a surrounding portion of said form, the height of said plug end being less than the depth of said hole; and

a flange portion of a greater cross-sectional area than said plug end presenting a substantially flat surface for engagement with a portion of said form surrounding said hole and an opposite bottom end presenting an annular lip and a support member spaced radially inward therefrom defining an annular groove therebetween, said support member and groove being located at said bottom end of said plug opposite said top end, said flat surface of said flange portion extending substantially perpendicular to said sidewall of said plug end and substantially parallel to said top end,

said flange and said plug end defining a centrally located bore extending axially therethrough, said bore being of a constant diameter adapted for slidably receiving a fastener therein, and being defined radially inwardly of said support member, said support member presenting a thickness defined by said bore and said groove, said thickness being greater than said bore,

said plug being unitarily formed of a mixture of high-density polyethylene and low-density polyethylene in a ratio of about one to five.

4,959,887

CENTER PIVOT COVER

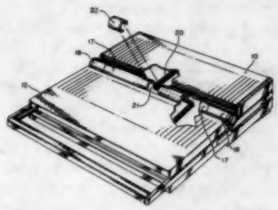
Eric I. Gruenberg, Soquel; James J. Halicho, Sunnyvale; Melvin J. Phillips, Cupertino, and Troy K. Hulick, San Jose, all of Calif., assignors to Apple Computer, Inc., Cupertino, Calif.

Filed May 16, 1989, Ser. No. 352,777
Int. Cl.[5] G06F *1/00*
U.S. Cl. 16—223 **10 Claims**

1. An improved hinge assembly for use in a computer system, said computer system having at least a main body section and a cover unit comprising:

a hinge means fixedly coupled to said cover unit, said hinge means having removed therefrom a longitudinal section so as to form a gap;

a cover means movably coupled to said hinge means, covering said gap;



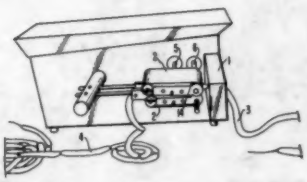
a stop means coupled to the main body section for holding said cover section in a fixed orientation relative to the main body section.

4,959,888

SAUSAGE TWISTING APPARATUS AND METHOD

Arne Nerhus, Olve, and Johan Nerhus, Klofterhagen 78, N-1067 Oslo 10, both of Norway, assignors to Olve Industrier A/S, Olve and Johan Nerhus, Oslo, both of, Norway

Filed Oct. 10, 1989, Ser. No. 418,636
Int. Cl.[5] A22C *11/10*
U.S. Cl. 17—34 **8 Claims**



1. An apparatus for twisting a continuous, filled tube of membranous tissue into a string of sausages, said apparatus comprising:

a pair of parallelly opposed, spaced belt conveyors for pulling in a length of the continuous tube longitudinally therebetween,

means for constricting and pinching the length of tube at an end thereof,

means for relative lateral displacement of said belt conveyors to roll the length of tube therebetween about its longitudinal axis, thereby twisting the tube length end adjacent said constrictor, and

means for driving said belt conveyors.

4,959,889

FRONTALLY "INVISIBLE" ADJUSTABLE TIE CLASP

Carlo G. Ciaravino, 1905 15th St., Boulder, Colo. 80302

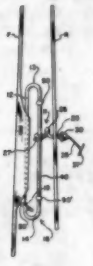
Filed Oct. 31, 1989, Ser. No. 429,329
Int. Cl.[5] A41D *25/00*
U.S. Cl. 24—49 R **8 Claims**

1. A frontally, invisible, adjustable tie clasp comprising:

a. an elongated oblong shaped pinning means for securing a front pendant and rear pendant of a tie, said elongated oblong pinning means is formed of a wire shaped material comprising a front long member with the lower end having a fabric piercing point engaged in a latching means and the upper end continuously joined to a u-shaped upper spring member, the other end of said u-shaped upper spring member is continuously joined to a parallel rear long member, said parallel rear long member has, at said rear parallel member's uppermost and lowermost parallel point, a slide stopping mechanism, continuously joined at

the lower end of said parallel rear member, opposite to said u-shaped upper spring member and in the same plane as the u-shaped upper spring member is a u-shaped lower member, on the end of said u-shaped lower member opposite the point where said parallel rear long member connects to said u-shaped lower member is said latching means, said latching means engages said fabric piercing point of said front long member holding said fabric piercing point securely against the spring tension of said front long member, and thus protecting said fabric piercing point from accidentally piercing the user or another fabric, said front long member is forced to angle away in an open position from the vertical when not engaged in said latching means by virtue of the spring quality of said u-shaped upper spring member thus allowing the piercing of the rear layer of material on the front pendant of a tie by said elongated oblong shaped pinning means, and

b. a sliding pointed tie tack member comprising a loop forming means at one end, a piercing point at its other end and a holding means located between said loop forming member and said piercing point, said loop forming means encir-



cles, and is there by connected to, said parallel rear member in the area on said parallel rear member between said upper slide stopping means and said lower slide stopping means, thereby said sliding tie tack member can slide up and down said rear long member without moving over to said front long member, said holding means is located between said loop forming means and said piercing point said holding means extends out vertically from either one, or both, sides of said sliding tie tack member perpendicular to the plane of the loop formed by said loop forming means whereby the user can hold said sliding pointed tie tack member by said holding means for the purpose of piercing the rear pendant of a tie and engaging a tie tack clutch, said sliding tie tack member allows movement of said rear pendant a tie independent of said front pendant of a tie and also secures said rear pendant of a tie in a verticle position behind said front pendant, said tie tack clutch is connected to a buttonhole engaging crossbar via a connecting means in order to secure said front and rear pendants of a tie with said tie clasp engaged to the front of a wearer's shirt.

4,959,890

INTERCHANGEABLE SNAP BUTTON SYSTEM

Mary K. Pazurek, 5634 El Canon Ave., Woodland Hills, Calif. 91367

Filed Oct. 10, 1989, Ser. No. 418,880

Int. Cl.[5] A44B *1/04*

U.S. Cl. 24—113 MP **16 Claims**

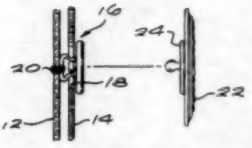
1. An interchangeable snap button system comprising:

a snap and button member of generally circular configuration of a predetermined diameter, having a front side thereof, and having a small loop extending from the rear thereof, said loop having a transverse extent which is not greater than said diameter;

a garment having a first edge to be buttoned to a second edge;

means securing said first snap and button member to said garment by said loop adjacent said first edge;

said garment having a buttonhole adjacent said second edge, with the extent of said buttonhole being slighly greater than said predetermined diameter, whereby said first snap member may be buttoned through said buttonhole with said loop extending through the hole; and



a decorative member having an extent greater than said predetermined diameter and greater than the extent of said buttonhole so that said decorative member cannot pass through said buttonhole, and having a second mating snap member secured thereto, for mating with said first snap and button member after said first snap member is buttoned through said buttonhole, to provide a decorative outer display for selective attachment to said first snap and button member.

4,959,891

ATTACHMENT DEVICE FOR STRAP END

An-Chuan Chou, No. 212, Yung-An Street, Tainan, Taiwan

Filed Mar. 28, 1990, Ser. No. 500,184

Int. Cl.[5] A44C *5/18*; F16B *1/00*

U.S. Cl. 24—265 A **1 Claim**

1. An attachment device for strap end comprising:

an elongated clamp member made of deformable material and having a flat bottom formed with a plurality of transverse recesses in one side thereof and opposed arcuate side walls defining a passageway along its longitudinal direction; and

a securing piece having a plate boy dimensioned to pass through the passageway defined by the clamp member and formed with a plurality of transverse protruberances having spikes thereon for engaging the trnasverse recesses by press through an overlapped section of a strap extending between the bottom of the clamp member and the securing means.

4,959,892

STRUCTURE OF SHAFTLESS CLIP

Bor-Jou Wang, 3/F No. 740, Ching Chen Road, Yung-Ho Taipai Hsien, Taiwan

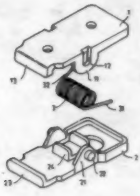
Filed Feb. 20, 1990, Ser. No. 481,265

Int. Cl.[5] A41F *1/00*; A44B *21/00*

U.S. Cl. 24—510 **1 Claim**

1. A shaftless clip, including a first clamping plate pivoted with a second clamping plate with a spring retained therebetween, wherein said first clamping plate comprises two downwardly vertical side boards on its both sides and an unitary jaw portion extending downward from its front end, said side boards comprising therein a slot each, and said second clamping plate comprises two upstanding lugs on its both sides, said

upstanding lugs comprising each an unitary pin transversely extending outward and inserted in the slot of either side board of said first clamping plate, an unitary jaw portion extending upward from its front end, and an U-shaped frame structure on



its upper surface for the positioning therein of said spring, and wherein said spring having two ends respectively stropped against the inner surface of said first and second clamping plates to force said the jaw portions thereof to constantly engage together.

4,959,893

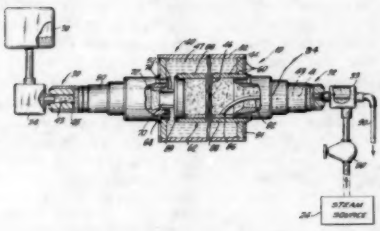
APPARATUS FOR A PRESHRINKING ARRANGEMENT TO HEAT THE FABRIC AT A CONTROLLED TEMPERATURE

Frank Catallo, 84 Wheatly Rd., Old Westbury, N.Y. 11568

Filed Oct. 6, 1989, Ser. No. 418,179

Int. Cl.[5] D06C *21/00*; F28D *11/02*

U.S. Cl. 26—18.6 **8 Claims**



1. In an apparatus for preshrinking fabric comprising, at least one roll member cooperating with another member to shrink fabric, said apparatus including a steam source arranged to dampen said fabric, said steam source also arranged to supply heat to one of said members, said fabric to move on said apparatus and in abutment with said one of said members and said one of said members including an internally disposed member arranged therein to provide a first internal and second external chamber relative said first internal chamber, said steam source being connected to said first chamber, and said one of said members including means to slidably and sealably separate said first chamber from said second chamber, means connected to said one of said members to permit movement of said internally disposed member relative said one of said members when heat in said first chamber causes distortion of said internally disposed member, an oil supply connected to said second chamber whereby said oil is heated by the steam so that said fabric in abutment with said one of said members is heated to a predetermined temperature.

4,959,894

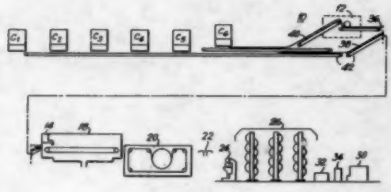
DISPOSABLE SEMI-DURABLE NONWOVEN FABRIC AND RELATED METHOD OF MANUFACTURE

Cecil W. Jeffers, Norwood, and Richard Sewcyk, Stoughton, both of Mass., assignors to International Paper Company, Purchase, N.Y.

Division of Ser. No. 221,816, Jul. 20, 1988. This application Jul. 21, 1989, Ser. No. 383,843

Int. Cl.[5] D04H *01/46*

U.S. Cl. 28—104 **5 Claims**



2. A method for producing a disposable and semi-durable nonwoven fabric which comprises the steps of:

(a) supporting a composite web of staple fibers on a first entangling member, said composite web including top and bottom sides formed by respective top and bottom web componen: layers, one of which is a carded web component layer and the other of which is a randomized web component layer, said first entangling member having a symmetrical pattern of fluid pervious void area;

(b) traversing the top side of said composite web with spaced columnar fluid jets at pressures within the range of 400 to 2000 psi for sufficient duration to effect a first stage randomization and entanglement of said web fibers and form nonwoven fabric having a structure determined by said first entangling member, said composite web in said first stage being impacted with energy of approximately 0.7 hp-hr/lb;

(c) supporting said composite web on a second entangling member having a symmetrical pattern of fluid pervious void areas, said symmetrical pattern of said second entangling member being different from that of said first entangling member; and

(d) traversing the bottom side of said composite web with spaced columnar fluid jets at pressures within the range of 400 to 2000 psi for sufficient duration to effect a second stage randomization and entanglement of the nonwoven fabric, said composite web in said second entangling stage being impacted with energy of approximately 1.2 hp-hr/lb, the fabric having a resulting structure determined by the coaction of the first and second randomization and entanglement on said first and second entangling members.

4,959,895

METHOD AND APPARATUS FOR SEPARATING MONOFILAMENTS FORMING A STRAND

Thomas B. Sager, Fairfield, Conn., assignor to Branson Ultrasonics Corporation, Danbury, Conn.

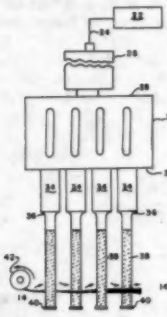
Filed Oct. 13, 1989, Ser. No. 421,124

Int. Cl.[5] D01D *1/00*; D02J *1/18*

U.S. Cl. 28—282 **16 Claims**

1. The method of separating and spreading monofilaments forming a strand comprising the steps of: providing a vibrating

surface, and passing the strand over and in forced contact with said vibrating surface in a direction causing the vibrations to be



applied to said strand substantially transverse to the longitudinal axis of said strand.

4,959,896

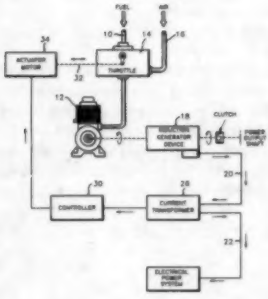
PROTECTION OF GAS ENGINE OR TURBINE FROM DAMAGE BY CHANGES IN OPERATING CHARACTERISTICS

William D. Bolin, Katy, and Robert L. Roper, Longview, both of Tex., assignors to Oryx Energy Company, Richardson, Tex.

Continuation of Ser. No. 3,441, Jan. 15, 1987. This application May 23, 1988, Ser. No. 203,528

Int. Cl.[5] F02D *29/06*

U.S. Cl. 290—40 B **13 Claims**



1. Apparatus for producing electrical power which comprises: combustion means for burning gaseous fuel; engine means powered by combustion products from said combustion means; throttle means for adjusting the relative amounts of gaseous fuel and oxygen-containing gas admitted to said combustion means; generator means powered by said engine means; and means for maintaining substantially constant current output from said generator, which means for maintaining comprise means for adjusting said throttle means to decrease the amount of fuel admitted to said combustion means when the current output from said generator increases, and to increase the amount of fuel admitted when said current output decreases.

4,959,897

TORSION SPRING MOUNTING APPARATUS

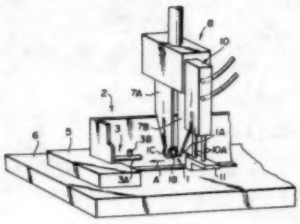
Masazumi Ogawa; Kenichi Watanabe, and Tsutomu Yamazaki, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jul. 13, 1989, Ser. No. 379,133

Claims priority, application Japan, Jul. 21, 1988, 63-182599

Int. Cl.[5] B23P *19/04*

U.S. Cl. 29—227 **4 Claims**



1. A torsion spring mounting apparatus for mounting a torsion spring on a spring support, said torsion spring comprising a leg portion, a coiled portion one end part of which extends to the leg portion, and an engagement portion which extends to the other end part of the coiled portion and is bent in the tangential direction of the coiled portion, said spring support comprising a cylindrical shaft onto which the coiled portion is to be fitted, and a ccil engaging protrusion embedded in the circumferential surface of the shaft such that the coil engaging protrusion is normal to the shaft,

wherein the improvement comprises the provision of:

(i) a spring movement means which grasps said torsion spring, and fits said coiled portion onto said shaft by moving said torsion spring along said shaft so that said engagement portion does not overlap said coil engaging protrusion, and

(ii) a push means which pushes said leg portion of said torsion spring, which has been fitted onto said shaft, in order to rotate said torsion spring along the circumferential direction of said shaft and to make said engagement portion engage with said coil engaging protrusion.

4,959,898

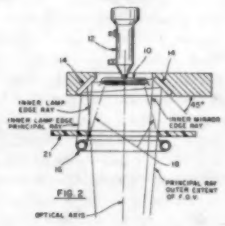
SURFACE MOUNT MACHINE WITH LEAD COPLANARITY VERIFIER

Marc M. Landman, Burlington, Mass.; Steven M. Whitman, Danville, N.H., and Robert J. Duncan, Magnolia, Mass., assignors to Emhart Industries, Inc., Towson, Md.

Filed May 22, 1990, Ser. No. 527,079

Int. Cl.[5] H05K *3/30*

U.S. Cl. 29—705 **4 Claims**



1. A machine for placing surface mount electronic components having a plurality of rows of horizontally extending leads

with the tips of the leads lying in a single plane and the tips of the leads in any row lying along a straight line, the machine comprising;

mirror means,

means for locating a surface mount electronic component at a selected position relative to said mirror means,

means for illuminating a composite image of the located component composed of a top view in the central portion of the field of view with four side views along the peripheral portion of the field of view such that an image is obtained of both the bottom surface of the component as well as the row of lead tips as viewed reflected from said mirror means,

camera means looking at said mirror means to see said reflected lead tips to define the Z location for each lead tip,

means for calibrating said system such that a precise coordinate mapping is obtained between the composite 3-D (X,Y,Z) object space comprised of the four side views reflected from said mirror means and the one direct top view to the 2-D (X,Y) image space,

means for correcting the defined Z location for each lead tip to compensate for optical effects,

means for determining the best reference plane for said lead tips,

means for calculating the actual Z deviation for each lead tip from the best reference plane, and

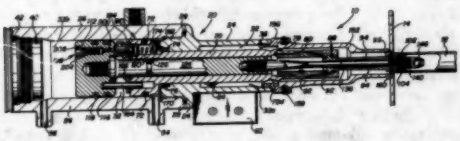
means for rejecting the component if the Z deviation for at least one lead tip exceeds a maximum allowable deviation.

4,959,899

TUBE PULLING DEVICE

Paul W. Martin, Springfield, Ohio, assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Oct. 27, 1989, Ser. No. 427,731
Int. Cl.[5] B23P *19/04, 15/26*
U.S. Cl. 29—726 **20 Claims**



1. A tube pulling device for extracting a tube from a tube sheet or the like comprising:

a cylindrical housing having an operating chamber with an opening at the forward end thereof and the rear end of said operating chamber being closed;

a front piston reciprocally disposed in said operating chamber and provided with an axial passage therethrough;

a tubular extension slidably disposed in said operating chamber opening and connected to said front piston;

said tubular extension including a plurality of spaced jaws for engaging the bore of the tube;

a rear piston reciprocally disposed in said operating chamber and having a piston rod disposed within said axial passage of said front piston extending for slidable movement in said operating chamber opening, said piston rod having first and second ends, said first end being connected to said rear piston;

expansion means interconnected to said second end of said piston rod and extending through said tubular extension of said front piston for spreading and contracting said plurality of spaced jaws upon rearward and forward movement of said rear piston;

said front piston including a fluid passageway communicating with said rear piston and a source of fluid for supplying fluid to said rear piston to thereby generate a force acting on said rear piston to move said rear piston in said operating chamber away from said opening thereby moving said expansion means into engagement with said plurality of spaced jaws;

control means disposed in said fluid passageway for controlling the flow of fluid from the supply source to said rear piston and for generating a variable force in response to forces acting on said rear piston;

actuating means disposed in said rear piston for engagement with said control means and responsive to changes in pressure generated by said variable force generated by said control means for terminating the flow of fluid through said fluid passageway to said rear piston when the force acting on said rear piston reaches a predetermined magnitude, thereby preventing further expansion of said plurality of spaced jaws and thereby causing the fluid from the fluid source to generate a force acting on said front piston; and

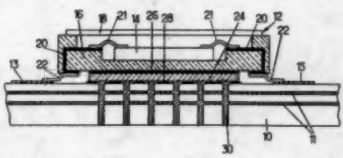
said force acting on said front piston thereby moving said front piston and said rear piston within the operating chamber away from said opening, thereby retracting said tubular extension into said operating chamber to extract the tube from the tube sheet without further expansion of said plurality of spaced jaws.

4,959,900

MOUNTING OF ELECTRONIC MICROCOMPONENTS ON A SUPPORT

Jacques de Givry, Les Loges En Josas; Jean C. Vallet, Velizy, and Jean P. Lalfer, Versailles, all of France, assignors to MATRA, Paris, France

Filed Jul. 17, 1989, Ser. No. 380,433
Claims priority, application France, Jul. 20, 1988, 88 09819
Int. Cl.[5] H05K *3/34*
U.S. Cl. 29—840 **8 Claims**



1. A method of flat mounting an electronic microcomponent on a printed circuit support, said microcomponent having solderable contacts on a lower face thereof, comprising: electrically connecting said solderable contacts of the microcomponent to respective pads on the printed circuit support through respective individual sections of flexible wires having a sufficient degree of curvature for avoiding transfer of mechanical stresses between said microcomponent and said printed circuit support and mechanically connecting the microcomponent to the support through a spacer having planar dimensions lesser than planar dimensions of the lower face of said microcomponent for providing access to said solderable contacts for connecting said sections thereto.

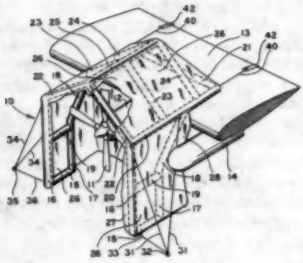
3. Method for mounting an electronic microcomponent having solderable contacts on a lower surface thereof flat on a printed circuit support, comprising: mechanically connecting the microcomponent to the support through mechanical connection means constructed and arranged for absorbing stresses due to differential expansion of said support and microcomponent; and electrically connecting the solderable contacts of the microcomponent to the respective pads on the printed circuit through sections of flexible wire having a rufficient degree of curvature for avoiding transfer of mechanical stresses between said microcomponent and circuit, by forming a grid including said sections, an outer edge strip and a central zone integral with said sections, connecting all sections at the same time on said contacts on the microcomponents, and cutting off said outer strip and said central zone.

4,959,901

PORTABLE INFLATABLE SHELTER AND METHOD OF ERECTION THEREOF

James M. Parish, Wadsworth, Ohio, assignor to SMR Technologies, Inc., Uniontown, Ohio

Filed Jun. 22, 1989, Ser. No. 370,199
Int. Cl.[5] E04H 15/20
U.S. Cl. 52—2 K 23 Claims



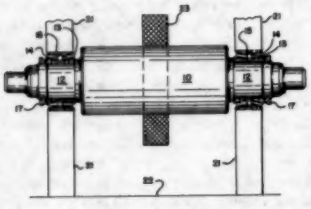
1. A portable inflatable shelter for temporarily covering a first portion of an object while partially resting on a second portion of the object comprising a plurality of inflatable interconnected tubes, and a fabric carried by said tubes such that when said tubes are inflated said fabric and said tubes form a roof section over the first portion of the object, side sections on each side of the first portion of the object, a front access opening between said side sections extending from said roof section opposite said front opening and an overhang section resting on said second portion of the object.

4,959,902

FINISH GRINDING PROCESS FOR ROTARY DIE CUTTING MACHINE

James T. Hamilton, 328 Sycamore Dr., Naperville, Ill. 60540

Filed Jul. 11, 1989, Ser. No. 378,055
Int. Cl.[5] B21D 53/12
U.S. Cl. 29—898.07 12 Claims



1. A process for finish grinding a cylinder for a rotary die cutting machine comprising the steps of:

assembling roller bearings on a cylinder shaft journal;

preloading the bearings to manufacturer specifications;

rotatably supporting the assembled roller bearings on finish grinder steady rests; and,

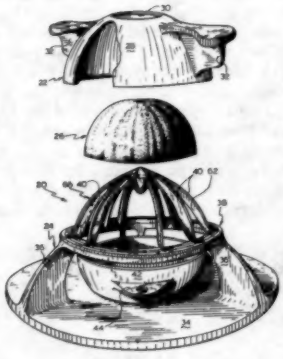
finish grinding the cylinder to achieve a desired total indicated runout (TIR).

4,959,903

CITRUS FRUIT PULP CUTTER

Gilbert Daoust, 1074 Cabana Avenue, Boisbriand, Canada (J7G 2P8), and Michel Gingras, 14713 Notre Dame Street, East Montreal, Canada (H1A 3T3)

Filed Jan. 13, 1989, Ser. No. 296,788
Int. Cl.[5] A22B 5/16
U.S. Cl. 30—123.5 15 Claims



1. A cutting device for segmenting and derinding a half-section of a citrus fruit, in order to collect the pulp segments thereof, said cutting device comprising: a rigid annular member; a first integral ring, a number of arcuate knives spacedly, upwardly projecting from and connected to said first ring, said arcuate knives converging toward and joined in a common apex area, said first ring and arcuate knives forming a generally semi-spherical outer open frame, said first being co-axial with and freely mounted to said annular member, each said knife having a lengthwise exterior bevelled sharpened segmenting edge facing radially outwardly and away from said first ring; a second ring, a number of arcuate blades spacedly upwardly projecting from and connected to said second ring, converging toward and joined in a common apex area, the number of said blades being equal to the number of said knives, said second ring and said blades forming a generally semi-spherical inner open frame, said blades located radially internally of said knives, said second ring being co-axial with and mounted to said annular member, each said blade having a first exterior sharpened derinding edge; slider means to enable said outer frame to rotate relative to said annular member about the center of the latter in a fruit-derinding direction; lock means to lock said inner frame to said annular member; each blade taking a concealed position inwardly of, and contiguous with an associated knife in an initial rotated position of said outer frame, said derinding edges being transverse to said knives segmenting edges and facing away from said fruit-derinding direction of rotation of said outer frame; whereby in operation, with said outer frame in said initial rotated position, the flat face of said fruit half is applied directly against and pushed fully into said outer frame for segmenting said pulp with said knives-segmenting edges, and the peel is thereafter manually rotated in said fruit-derinding direction, so as to draw therewith said outer frame exclusively of said inner frame, which is locked to said annular member, for derinding the fruit with said blade-derinding edges.

4,959,904

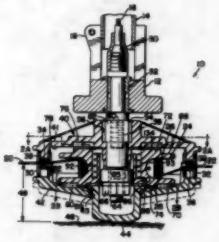
SIMPLE FLAIL FEEDOUT MECHANISM FOR A ROTARY MOWER

Raymond E. Proulx, 8409 Utica Ave., Rancho Cucamonga, Calif. 91730

Continuation of Ser. No. 306,279, Feb. 2, 1989, abandoned, which is a continuation of Ser. No. 928,837, Nov. 10, 1986, abandoned. This application Jul. 7, 1989, Ser. No. 377,772

Int. Cl.[5] B26B *7/00*

U.S. Cl. 30—276 14 Claims



7. A mower head for a flail-type mower which utilizes a spinning filament-like cutting flail to effect a mowing action, said mower head comprising:

a spinnable housing part having a spin axis, normally upper and lower portions spaced along said axis, and means for connecting said housing part to a driver for spinning said housing part on said axis,

a spool part mounted within said housing part between said housing portions for rotation of said spool part on said axis relative to said housing part and axial movement of said spool part along said axis relative to said housing part between lower and upper positions, and said spool part having normally upper and lower sides facing said upper and lower housing portions, respectively,

spring means acting between said parts urging said spool part to said lower position,

a bumper at the lower side of the spool part and extending below said lower housing portion and adapted to be periodically bumped against the ground during spinning of said head by a driver to alternately press said spool part upwardly relative to said housing part from said lower position to said upper position and then release said spool part for downward return to said lower position by said spring means,

coacting engagable means on said housing portions and spool sides, respectively, operable during spinning of said head by a driver for (a) drivably coupling said parts to one another to effect spinning of said spool part with said housing part when said spool part for rotation through a first given angle in one direction relative to said housing part and then positively blocking further rotation of the spool part in said one direction relative to said housing part in response to axial movement of said spool part from said lower position to said upper position, and (c) releasing said spool part for additional rotation through a second given angle in said one direction relative to said housing part and then positively blocking further rotation of said spool part in said one direction relative to said housing part in response to axial movement of said spool part from said upper position to said lower position, and wherein

said spool part is adapted to contain a filament-like cutting flail with a free end of the flail extending out from said housing part and with the flail wound about the spool part in a direction such that centrifugal force acting on said flail free end during spinning of said head tends to rotate said spool part in said one direction relative to said housing part, whereby each bump of said bumper against the ground during spinning of said housing part by a driver with a flail wound on said spool part effects unwinding of a fixed length of the flail from said spool part.

4,959,905

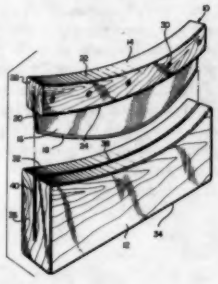
PIZZA KNIFE AND HOLDER

Michael Ghislain, 1151 Medinah Way, Twin Lakes, Wis. 53181

Filed Jun. 26, 1989, Ser. No. 372,425

Int. Cl.[5] B26B *3/06*

U.S. Cl. 30—298.4 13 Claims



1. A food cutting device comprising:

an elongated blade having an upper edge, a lower food cutting edge, and straight sides extending from the outer ends of said lower food cutting edge to the outer ends of said upper edge, said lower edge being convexly curved and being relatively blunt; and

an elongated handle affixed to said blade near the upper edge of said blade and directly above said lower food cutting edge, said handle extending continuously over at least the entire length of said blade, said handle having a smooth concavely curved top and being wide enough and long enough to provide a continuous hand grasping portion whereby the cutting action is achieved by grasping two positions on said hand grasping portion and alternately applying downward pressure at each position of said hand grasping portion in a rocking motion.

4,959,906

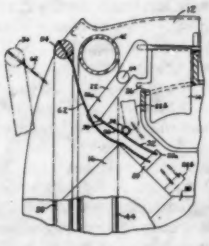
SAFETY DEVICE FOR CHAIN SAWS

Marvin J. Moore, Jr., 328 Meyer Ave., Dayton, Ohio 45431

Filed Aug. 28, 1989, Ser. No. 399,616

Int. Cl.[5] B23D *57/02*

U.S. Cl. 30—381 7 Claims



1. In a chain saw that comprises a housing, a handle secured to said housing, said handle having a generally horizontal hand grip section extending above the housing; a carburetor located within said housing, said carburetor having a throttle operator arm movable through a predetermined stroke between an idle

setting and a full power setting; a manual trigger mechanism carried on the housing; and link means between the trigger mechanism and the throttle operator arm;

the improvement comprising a safety device mounted on the chain saw housing for preventing movement of the throttle arm from its idle setting; said safety device including a bar structure swingably mounted on the chain saw, said bar structure comprising a bar operator section extending along the aforementioned hand grip section so that when the user places his fingers around the hand grip section the fingers will contact the bar operator section to enable the user to pull said bar operator section toward the hand grip section; spring means acting on the bar structure to move said bar operator section away from the hand grip section; and a flexible wire-like connector between said bar operator section and said throttle arm; said flexible connector assuming a taut condition when said bar operator section is spring-biased away from the hand grip section, whereby the throttle arm is then retained in its idle setting even though the trigger mechanism is moved to a position calling for full engine power.

4,959,907

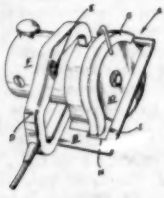
CIRCULAR SAW ACCESSORY

John D. Buratty, R.D. #1, Rockwood, Pa. 15557

Filed Oct. 27, 1988, Ser. No. 263,364

Int. Cl.[5] B23D *45/16*

U.S. Cl. 30—388 **2 Claims**



1. An adaptor and saw blade combination for a rotary powered saw of the type embodying a driven rotary shaft having a saw blade receiving lug on its outer end and a threaded axial bore opening through said lug, comprising; and adaptor having an elongated shaft with a first end and a second end, said first end being a screw threaded shank for joining said adaptor to the rotary powered saw rotary shaft, said second end having an integral abutment and shaft for receiving a saw blade with a mounting means, where said shaft and said mounting means mate to prevent said saw blade from spinning on said shaft, a saw blade compatible with said adaptor to allow close cuts parallel to a wall surface, said saw blade having a recessed mounting means of frusto conical shape to conceal a screw threaded mounting fastener, whereby the surface of said saw blade opposite said recessed mounting means is flat to allow said saw blade to cut close to a wall surface, said adaptor elongated shaft has parallel lands for receiving a tightening implement to secure said adaptor to said rotary powered saw rotary shaft, said shaft on said second end of said adaptor has an arcuate cross section with a flat land and said saw blade mounting means has an arcuately shaped aperture with a flat land to mate with said shaft on said second end of said adaptor.

4,959,908

ATTACHMENT ARRANGEMENT FOR A SIGHTING TELESCOPE

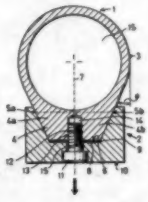
Adolf Weyrauch, Aalen, Fed. Rep. of Germany, assignor to Carl-Zeiss-Stiftung, Heidenheim, Fed. Rep. of Germany

Filed Jun. 14, 1989, Ser. No. 366,148

Claims priority, application Fed. Rep. of Germany, Jun. 16, 1988, 3820471

Int. Cl.[5] F41G *1/38*

U.S. Cl. 33—245 **10 Claims**



2. An attachment arrangement for a sighting telescope having a housing, the attachment arrangement comprising:

a housing rail extending from said housing;

an adaptor defining an adaptor rail formed therein for accommodating said housing rail;

said housing rail and said adaptor rail having forms corresponding to respective trapezoids when viewed in cross section and said housing rail being placed in said adaptor rail so as to cause the legs of the trapezoid of said housing rail to be in contact engagement with corresponding ones of the legs of the trapezoid of said adaptor rail;

fixing means for pulling said housing rail into said adaptor rail;

said trapezoids having respective short bases which are mutually adjacent and said short bases having respective lengths selected so as to cause said short bases to define and maintain a clear space therebetween in the presence of said pulling force; and,

said fixing means being a screw defining a longitudinal screw axis and said screw being mounted in said adaptor and threadably engaging said housing rail so as to pull said housing rail into said adaptor rail.

4,959,909

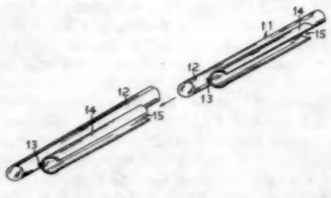
CONTOUR TRACER

Man T. Wong, 370 Dixon Road, Apt 1008, Weston, Ontario, Canada (M9R 1T2)

Filed Sep. 26, 1988, Ser. No. 248,612

Int. Cl.[5] G01B *5/20*

U.S. Cl. 33—501.1 **3 Claims**



1. A contour tracer substantially rectangular in shape and having a plurality of elongated section members slidably coupled together wherein each section member having a cross sectional OC configuration comprising,

an elongated solid cylindrical rod member having a circular diameter,

an elongated hollow cylindrical sheath member disposed in a parallel manner in a close proximity from said rod member, said sheath member having a substantially C-shaped cross section and having a thin side wall of a selected thickness,

an opened slot formed along a lateral side of said sheath member and extending throughout the entire longitudinal length of said sheath member,

said sheath member having an inside diameter equal to said circular diameter of said rod member, and said slot having a width less than said inside diameter of said sheath member,

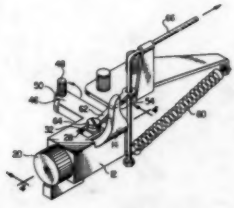
said sheath member and said rod member being joined together by a web means disposed along a longitudinal side of said sheath member and located diametrically opposite to said slot, said web means having a cross sectional length extending from said sheath member to said rod member, and said cross sectional length being substantially equal to the thickness of said side wall of said sheath member.

4,959,910

PRINTING PRESS

Tommy R. Hamilton, 9712 Carnegie, Dallas, Tex. 75228

Filed Jan. 16, 1990, Ser. No. 465,901
Int. Cl.[5] G01D *21/00*
U.S. Cl. 33—623 **10 Claims**



1. An improved register cam for use on a printing press having alignment means for transversely aligning the printing medium, said register cam comprising:

a body;

a camming member extending outwardly from said body;

mounting means for operatively mounting said register cam on said printing press; and

adjustment means for selectively moving at least a portion of said alignment means relative to said camming member, whereby the transverse position of said alignment means is adjustable in response to the operation of said adjustment means.

4,959,911

APPARATUS FOR DRYING GARMENTS

John Woleas, 40 Hazel Ave., Glencoe, Ill. 60022, and Nancy McGee, 44 Lawton Rd., Riverside, Ill. 60546

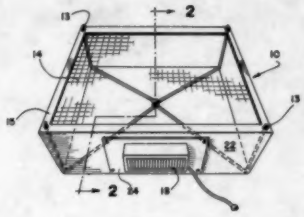
Continuation of Ser. No. 225,283, Jul. 28, 1988, abandoned, which is a continuation of Ser. No. 88,099, Aug. 21, 1987, abandoned, and a continuation-in-part of Ser. No. 48,238, May 11, 1987, Pat. No. 4,777,737. This application Nov. 13, 1989, Ser. No. 434,763
Int. Cl.[5] F26B *25/18*
U.S. Cl. 34—237 **3 Claims**

1. A portable and easily assembled and disassembled apparatus for drying a garment comprising:

a collapsible wire frame;

an air permeable and foldable net removably connected to said frame, said net having means being adapted to support said garment above said frame in a generally horizontal orientation;

a water impermeable bottom covering removably assembled to said frame, said bottom covering being constructed from a foldable sheet material; said bottom covering including a bottom and four sidewalls; and



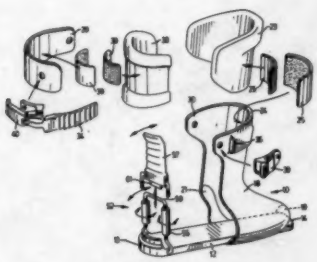
an air circulating means removably mounted directly to one of said sidewalls of said bottom covering for conveying air at about ambient temperature from the surrounding environment into said bottom covering and up and through said net and garment.

4,959,912

DOWNHILL SKI BOOT ASSEMBLY

William H. Kaufman, Frederick A. Harrison, both of Kitchener; Claude J. Gidman, Toronto; and Gerald Beekenkamp, Paris, all of Canada, assignors to William H. Kaufman Inc., Kitchener, Canada

Filed Dec. 11, 1989, Ser. No. 448,262
Int. Cl.[5] A43B *5/04*
U.S. Cl. 36—117 **7 Claims**



1. A downhill ski boot assembly, comprising:

a ski boot shell having an elongate rigid sole plate with heel and toe portions adapted to be insertable into a downhill ski binding; a unitary stiff forefoot and shin piece attached to the forward portion of the sole plate, the forefoot and shin piece having an opening at the front of it to allow the toe portion of a boot to extend therethrough; adjustable heel hold down means attached to the sole plate for engaging the heel portion of said boot and holding it against the sole plate; and a calf strap attached to the top of the forefoot and shin piece for engaging a skier's lower leg; and

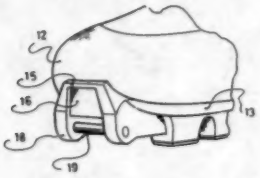
said boot being made of a flexible material enabling the wearer to walk normally and being sized to fit in the ski boot shell, the boot having heel means adapted to coact with the heel hold down means of the ski boot shell.

4,959,913

CROSS-COUNTRY SKI SHOE FOR USE WITH AN ELASTIC BIASING ELEMENT

Marc Provence, Thorens les Glieres; Didier Rousset, Lescheraines, and Josiane Dunand, Cran Gevrier, all of France, assignors to Salomon S.A., Annecy Cedex, France

Filed Jul. 11, 1989, Ser. No. 378,320
Claims priority, application France, Jul. 13, 1988, 88-09982
Int. Cl.[5] A43B *5/04*
U.S. Cl. 36—117 **20 Claims**



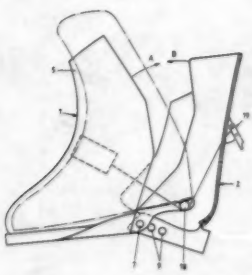
1. Cross-country skiing shoe having a transverse journal axle at its front end for journalling the shoe on a ski and a support surface on said shoe adapted to contact an elastic element of a binding which exerts a return force on the shoe when the shoe is pivoted upwardly about the axle, the improvement comprising the journal axle being spaced a predetermined distance beneath the support surface for the elastic element.

4,959,914

SKI-BOOT

Kurt Hilgarth, Graz, Austria, assignor to Skischuhfabrik Dynafit Gesellschaft mbH, Graz, Austria

Filed Nov. 1, 1988, Ser. No. 265,811
Claims priority, application Austria, Dec. 30, 1987, 3452/87
Int. Cl.[5] A43B *5/04, 3/26*
U.S. Cl. 36—120 **12 Claims**



1. A ski-boot comprising:

a toe shell having an inside, an outside, an arch region and a sole region,

a heel shell, said toe shell having a sole portion and an extension projecting into said heel shell,

a lining sock inserted into said toe shell, said sock being open on a heel side,

a cushion means provided on the inside of said heel shell for closing said lining sock,

a hinged connection hinging the heel shell to said toe shell in a partition region of the shells at a back part of the sole region thereof in the partition region of the shells, about a hinge line transverse to the longitudinal direction of the boat, so that both of said shells can swing in a downward direction with respect to said hinge line, the two shells, when swung apart, permitting stepping into the boot and being fixed together in the position where the shells are swung towards each other, at least one of said shells comprising a plurality of bores arranged, in succession, at several positions in a longitudinal direction of said ski-boot to enable formation of said hinged connection at one of a plurality of predetermined longitudinal positions so that said shells are mutually adjustable in said longitudinal direction,

a releasable snaplock member provided on said heel shell, into which said extension of said toe shell snaps when the ski-boot is stepped into, the two shells overlapping, and

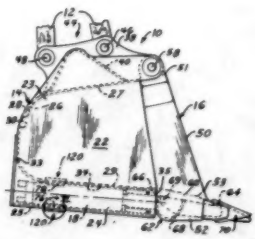
flaps provided in edge regions of said heel shell which bear against the inside of the toe shell in the arch region.

4,959,915

IMPACT BUCKET APPARATUS

Michael A. Roussin, Peoria, and Brent C. Bargfrede, Dunlap, both of Ill., assignors to Caterpillar Inc., Peoria, Ill.

Filed Mar. 6, 1989, Ser. No. 318,997
Int. Cl.[5] E02F *5/00*
U.S. Cl. 37—141 R **11 Claims**



1. An impact bucket apparatus adapted when in use to be pivotally mounted on a moveable manipulator of a vehicle, comprising:

a bucket having a pair of spaced apart side plates, each having upper and lower portions, a bottom plate attached to the lower portion of each of the side plates at the bottom thereof, and a curved body portion attached to each of the side plates and spaced from the bottom plate, the lower portions of the side plates, the bottom plate, and curved body portion define an impactor cavity having an opening within the bucket;

a cutting edge assembly includes a pair of spaced apart arms having upper and lower portions and a cutting edge having an edge portion and a reinforcing gusset defining an impact surface, the cutting edge being attached between and to the lower portions of the arms, the upper portions of the arms being pivotally attached to the upper portions of the side pates, the cutting edge being movable between a position adjacent the opening of the impactor cavity and a position spaced from the opening thereof;

means for guiding and limiting pivotal movement of the cutting edge assembly including a stub shaft attached to the cutting edge and having a distal end projecting therefrom into the mounting assembly; and

an impact hammer located in the impactor cavity of the bucket and including a piston having an impact surface aligned with and positioned to contact the impact surface of the cutting edge.

4,959,916

FRAME APPARATUS

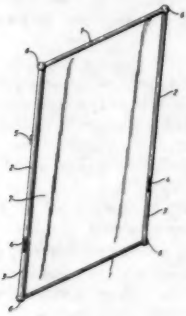
Ian R. Cochrane, 23 Guildford Street, Brighton BN1 3LS, United Kingdom

Filed Jan. 6, 1989, Ser. No. 294,375

Claims priority, application United Kingdom, Jan. 12, 1988, 8800558

Int. Cl.[5] G09F *17/00*

U.S. Cl. 40—603 **16 Claims**



1. A frame apparatus for the display of sheet material, comprising:

two spaced frame members that are both telescopically compressible against resilient opposition, two rail members between which an item of sheet material may be arranged in connection with both such rail members, corner joints at junctions between said two telescopic frame members and said two rail members, and stabilizing means also interconnecting said two frame members;

wherein said apparatus is constructed and arranged to gently stretch exhibited sheet material in two coplanar and relatively perpendicular directions; and

wherein the means by which material to be displayed is fixedly connected to the rail members comprises corner clamps each formed in two parts which are pivotable relative to one another about an axis which, in use, will be substantially vertically disposed, said two parts comprising interengaging projections and recesses between which a corresponding corner of the material to be displayed can be retainingly entered.

4,959,917

CHOKE TUBE WRENCH FOR ANY GAUGE SHOTGUN

Stavros Mavrakis, 7725 Colonial Rd., Brooklyn, N.Y. 11209, and Thomas R. Cresci, 58 Consant Ave., Staten Island, N.Y. 10314

Filed Nov. 1, 1989, Ser. No. 430,830

Int. Cl.[5] F41A *35/00*

U.S. Cl. 42—90 **4 Claims**

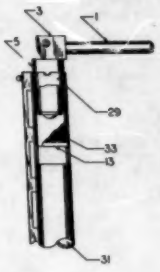
1. A choke tube wrench for removing or installing a threaded choke tube, said choke tube having a proximal end and a distal end and having a plurality of notches in said proximal end, in a shotgun barrel having a muzzle opening, said proximal end of said choke tube lying nearer said muzzle opening, comprising:

an elastic expanding element having an initial diameter and a proximal end and a distal end;

means for expanding said elastic expanding element; and

a handle attached to said means for expanding;

wherein said elastic expanding element is inserted into said shotgun barrel, said proximal end of said elastic expanding element lying nearer said muzzle opening, so that once said means for expanding said elastic expanding element are actuated, said initial diameter increases until said elastic expanding element tightly engages said choke tube, at



which point said handle can be turned, transmitting a torque to said choke tube and turning said choke tube.

4,959,918

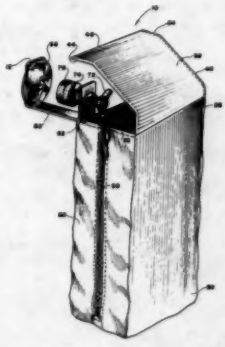
SHELL CATCHER DEVICE

Kenneth M. Perez, 19427 Section Rd., Covington, La. 70433

Filed Jun. 21, 1989, Ser. No. 369,617

Int. Cl.[5] F41A *9/60*

U.S. Cl. 42—98 **6 Claims**



1. A shell catcher device for a hand-held firearm, comprising:

a collapsible shell receiving means, comprising a substantially rigid housing frame having a periphery which defines a shell receiving opening and a collapsible housing body which is fixedly attached to said housing frame for receiving and retaining shells expelled from the firearm; and

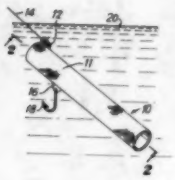
a means for mounting said shell receiving means on the firearm, said mounting means comprising a generally U-shaped bracket securedly attached to said rigid housing frame, said bracket comprising an elongated plate extending outwardly from said rigid frame about a horizontal plane of the shell receiving opening, a first attachment plate carried by one end of said elongated plate, a second attachment plate carried by an opposite end of said elongated plate, said first and said second attachment plates extending substantially perpendicularly to said elongated plate, and wherein said first attachment plate carries a concave suction cup means with a concave surface facing said second attachment plate.

4,959,919

ILLUMINATED FISHING LURE AND BATTERY THEREFOR

Bhaskara M. L. Rao, Flemington; James C. Menke, Maplewood, and Robert P. Hamlen, Bernardsville, all of N.J., assignors to Alupower, Inc., Bernardsville, N.J.

Filed Mar. 4, 1988, Ser. No. 164,215
Int. Cl.[5] A01K *85/00*
U.S. Cl. 43—17.6 **7 Claims**



1. A fishing lure comprising

(a) a fully submersible fishing lure body having a hollow interior open to receive liquid in which the body is submerged, and a light-transmissive wall;

(b) an electrically energizable light source disposed within said interior to produce light visible through said wall; and

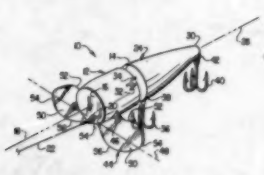
(c) a battery comprising spaced electrodes mounted in said interior and electrically connected to said light source, said electrodes being so constituted and arranged that, when said body is submerged in salt water and salt water is received in said interior, the electrodes cooperate with the received salt water as an electrolyte to produce electric current for energizing said light source.

4,959,920

MULTI-ACTION FISHING LURE

Wendall C. Walker, 1525 E. 2nd St., Apt. 1111, Granbury, Tex. 76048

Filed Apr. 6, 1989, Ser. No. 334,592
Int. Cl.[5] A01K *85/00*
U.S. Cl. 43—42.47 **18 Claims**



1. A floating/diving multi-action fishing lure having an at-rest water surface position and comprising:

a buoyant head section extending along an axis and having a rear end and a front end portion spaced apart from said rear end along said axis, said front end portion having a concavely dished front end surface;

a buoyant tail section having front and rear ends spaced apart along an axis, said front end of said tail section being jointedly secured to said rear end of said head section in a spaced relationship therewith;

at least one hook member operatively secured to one of said head and tail sections;

a line attachment eye member operatively secured to said front end portion of said head section and connectable to the lure end of a fishing line; and

elongated, generally planar lip means transversely secured to a front underside portion of said head section, the plane of said lip means being forwardly and downwardly sloped relative to said head section axis, said lip means laterally protruding forwardly and downwardly beyond said front end portion of said head section, and longitudinally projecting generally horizontally outwardly from opposite side portions of said head section, said lip means being selectively operative to:

cooperate with said concavely dished front end surface of said head section to create a surface water pop forwardly thereof in response to a forward line tug exerted on said line attachment member with said lure in its at-rest water surface position, and diminish the forward surface travel of said lure created by the forward line tug, or

cause said lure to twitch side-to-side on the water surface in response to a series of generally forward, sequentially oppositely horizontally angled line tugs exerted on said line attachment eye member with said lure in its at-rest water surface position, and diminish the forward surface travel of said lure created by the oppositely angled line tugs, or

cause said lure to dive beneath the surface of the water and travel in a forward, side-to-side wiggling motion in response to a continuing line retrieval force exerted on said line attachment eye member and initiated when said lure is in its at-rest water surface position,

said lip means being further operative, in response to a relatively hard, horizontally angled line pull on said line attachment eye member and an ensuing continuous line retrieval force thereon, to cause said lure to roll over from its at-rest water surface position onto its upper side, to an inverted lure position, and move forwardly along the water surface creating a water plume passing rearwardly over the inverted lip means

said lure further comprising weight means, carried by said head section, for causing said lure to roll back over from said inverted lure position to its at-rest water surface position in response to termination of line force on said line attachment eye member,

cooperate with said concavely dished front end surface of said head section to create a surface water pop forwardly thereof in response to a forward line tug exerted on said line attachment member with said lure in its at-rest water surface position, and diminish the forward surface travel of said lure created by the forward line tug, or

cause said lure to twitch side-to-side on the water surface in response to a series of generally forward, sequentially oppositely horizontally angled line tugs exerted on said line attachment eye member with said lure in its at-rest water surface position, and diminish the forward surface travel of said lure created by the oppositely angled line tugs, or

cause said lure to dive beneath the surface of the water and travel in a forward, side-to-side wiggling motion in response to a continuing line retrieval force exerted on said line attachment eye member and initiated when said lure is in its at-rest water surface position,

said lip means being further operative, in response to a relatively hard, horizontally angled line pull on said line attachment eye member and an ensuing continuous line retrieval force thereon, to cause said lure to roll over from its at-rest water surface position onto its upper side, to an inverted lure position, and move forwardly along the water surface creating a water plume passing rearwardly over the inverted lip means

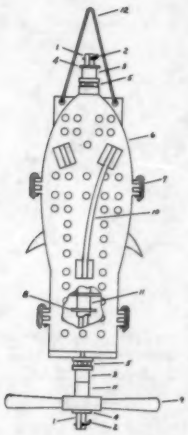
said lure further comprising weight means, carried by said head section, for causing said lure to roll back over from said inverted lure position to its at-rest water surface position in response to termination of line force on said line attachment eye member.

4,959,921

DEVICE FOR CUTTING OR SHREDDING LARGE PIECES OF BAIT INTO SMALLER ONES WHILE BEING TOWED THROUGH WATER

Alan J. Stanish; Dane T. Stanish, and Andrew J. Stanish, all of 537 N. Rainbow Dr., Hollywood, Fla. 33021

Filed Aug. 21, 1989, Ser. No. 396,087
Int. Cl.[5] A01K 97/02
U.S. Cl. 43—44.99 3 Claims



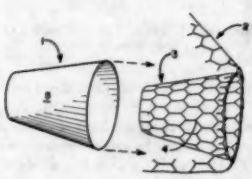
1. A waterborne apparatus for cutting and dispensing bait while being towed through water comprising a hinged perforated container, having a shaft mounted therein; means for cutting positioned inside said container on said shaft such that said means for cutting may rotate freely inside said container; a propeller affixed to the aft end of said shaft which rotates as the device moves through the water thereby rotating said means for cutting; stabilizers positioned on each side of said container, and two attachment points for a towing bridle on the forward end of said container.

4,959,922

AQUATIC TRAP FUNNEL

Robert J. Rhodes, 5350 San Martine St., Stevensville, Mich. 49127

Filed Mar. 3, 1989, Ser. No. 334,866
Int. Cl.[5] A01K 69/06
U.S. Cl. 43—100 4 Claims



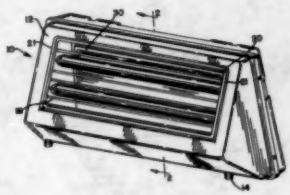
1. In combination with an aquatic animal trap having at least one entrance opening formed by an inwardly protruding mesh entrance tube, an improvement comprising a substantially smooth layer of laminating material attached to and substantially covering said mesh entrance tube on the inside of said trap.

4,959,923

ELECTRONIC INSECT TRAP

Salvatore F. Aiello; Jeffrey K. Brown; Donald F. Karasek; Edward J. Lazzeroni, Sr.; Edward J. Lazzeroni, Jr.; John F. Quella, all of Racine County, and Timothy E. Zollers, Milwaukee County, all of, assignors to S. C. Johnson & Son, Inc., Racine, Wis.

Filed Apr. 14, 1989, Ser. No. 338,068
Int. Cl.[5] A01M 1/22
U.S. Cl. 43—112 31 Claims



1. An electronic insect trapping device comprising:
an external housing having a central recess therein and an opening on one face thereof,
a trap structure placed within and upon the bottom of said recess,
at least one source of UV light placed within said recess, said trap structure including means for collecting and for retaining said insects,
an electrically conductive grid structure within and against one side of said recess, said grid structure having alternating raised areas of conductivity and spaces of non-conductivity thereupon, said conductive areas being so arranged that, when the grid is energized, each area of one potential is adjacent to, but separated by a non-conductive space from, an area of opposite potential, and
connected to said grid structure, means for converting electric current to a form effective to energize said grid with timed cycles of pulsed electric current at a controlled voltage and frequency.

4,959,924

INSECT BAIT STATION

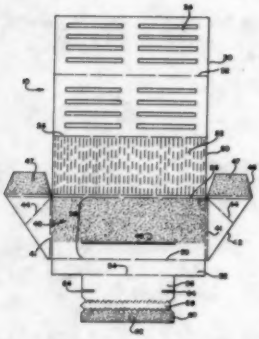
John Martin, Racine County, Wis., assignor to S. C. Johnson & Son, Inc., Racine, Wis.

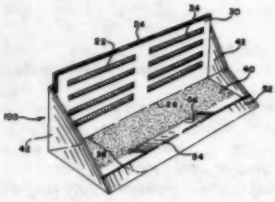
Filed Apr. 5, 1989, Ser. No. 333,707
Int. Cl.[5] A01M 1/14
U.S. Cl. 43—114 14 Claims

1. A blank for fabricating a device for holding an insect-attracting bait for killing flying insects comprising:
an essentially rectangular blank having a central section extending laterally across the width of the blank and bounded at its upper and lower edges by first and second fold lines extending laterally across the width of the blank respectively, said central section being coated on one side with an insect-attracting bait, and,
adjacent said central section on the upper side thereof and separated therefrom by said first fold line extending across the width of the blank, a grille section having at least one opening therethrough, said grille section being essentially double the width of the central section and being bisected laterally into equal and identical parts by a third fold line so that when the two segments of the grille section are folded upon each other, the opening locations are superimposed, and so that a further folding along said first fold line separating the grille section from the central section serves to position the doubled over grille section against the central section, and,
adjacent said central section on the lower side thereof and

separated therefrom by said second fold line, a tray section extending across the width of the blank:

means for supporting said tray section in a configuration essentially perpendicular to said central section:





means for closing the blank, after the grille and tray sections have been folded against the central section, into an envelope-like unit.

4,959,925

APPARATUS AND METHOD FOR VAPORIZING ACTIVE SUBSTANCES

Kurt D. Nelson, Mt. Pleasant Township, Racine County; Joseph E. Sua, Racine; Edward J. Lazzeroni, Sr., Caledonia Township, Racine County; Timothy E. Zollers, Franklin, all of Wis., and Jimmy J. Hanko, Lexington, Ky., assignors to S. C. Johnson & Son, Inc., Racine, Wis.

Filed Oct. 11, 1989, Ser. No. 419,791

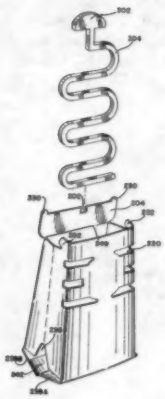
Int. Cl.[5] A01M *13/00*

U.S. Cl. 43—125 **10 Claims**

1. An apparatus for vaporizing insecticidally active substances comprising:

an elongated stick of a combustible substance containing an active insecticidal ingredient, having at one end thereof a support means, and

a hollow support stand designed to accept the stick of combustible material, the support stand having a first and a second face panel, a first and a second side panel, a base portion, and a top portion, the top portion having therein holding means into which the support means of the stick of combustible material may be placed so that the stick hangs downward into the interior of the support stand, without contact with the face or side panels of the support stand, the support stand having one or more ventilation openings formed into one or more of its face panels and one or more updraft openings formed into one or more of its side panels, and the top portion incompletely covering



the top of the support stand so as to form a chimney opening for the support stand.

4,959,926

GROWING MEDIUM FOR PLANTS

Frank W. Moffet, Jr., 944 Allens Creek Rd., Rochester, N.Y. 14618

Division of Ser. No. 855,757, Apr. 24, 1986, Pat. No. 4,803,803. This application Jul. 18, 1988, Ser. No. 222,095

The portion of the term of this patent subsequent to Feb. 14, 2006, has been disclaimed.

Int. Cl.[5] A01G *31/00*

U.S. Cl. 47—59 **15 Claims**

1. In a method of growing plants which comprises planting a plant in a composition and feeding fertilizer and water to the plant in a growth stimulating amount; wherein the improvement comprises planting the plant in a composition comprising a blend of mineral wool fibers; particles of cation exchange material selected from the group consisting of vermiculite and perlite; and powdered phenol-formaldehyde resin; said resin having an acidic pH and said fibers being in the form of tufts having interstitial space contained therein; and said resin powder being substantially dispersed in the interstitial space in the tufts.

4,959,927

DOOR DRAFT STOPPER

Arthur B. Atkinson, R.D. Box 443 Old Bentley Rd., Hightstown, N.J. 08520

Filed Sep. 1, 1989, Ser. No. 401,932

Int. Cl.[5] E06B *7/16*

U.S. Cl. 49—476 **2 Claims**

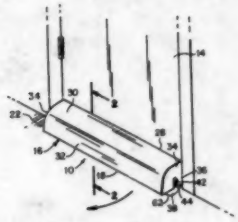
1. A roller-type door draft stopper for installation near a bottom edge of a swinging door comprising:

(a) an open bottomed, elongated hood member including a flat rear wall to be placed against the door near the bottom edge thereof; a curved top wall extending to a front wall of said hood member; and a pair of side walls and a plurality of spaced apart internal walls, having respectively aligned blind-ended vertical slots extending upwardly from the open bottom;

(b) a floating roller assembly disposed within the open bottom of said hood member for relative free vertical movement therein; and including a plurality of roller members each having a longitudinal aperture therethrough; a shaft disposed through said longitudinal apertures and extend-

ing freely through said vertical slots with said roller members separated from each other by said internal walls; and a pair of caps, disposed respectively on distal ends of said shaft to hold and guide said shaft enabling said shaft to rise freely up and down within the vertical slots;

(c) means for installing said hood member near the bottom edge of the door comprising at least two spaced apart fasteners attached to the door near the bottom edge thereof; and said rear wall of said hood member further having at least two spaced apart mounting apertures, each



of said holes having an enlarged bottom entry portion for alignment with and receipt of one head of one of said fasteners and a narrow top portion for receiving a shank of said respective fasteners when said hood member is pushed downwardly securing the hood member to the door whereby said roller assembly will be rolled along a floor in contact therewith when the door is opened and closed said roller assembly will bear against a sill under the bottom edge of the door when the door is closed sealing a draft area between the bottom edge of the door and the sill.

4,959,928

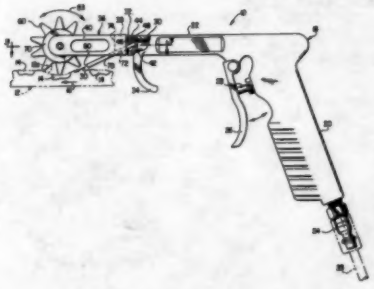
AIR-ASSISTED BUFFING PAD CLEANING TOOL AND ASSOCIATED CLEANING METHODS

Carl C. Hartwig, Sr., P.O. Box 734, Princeton, Tex. 75077

Filed Oct. 12, 1989, Ser. No. 420,529

Int. Cl.[5] B24B *53/00*

U.S. Cl. 51—262 A **7 Claims**



1. A tool for mechanically cleaning a rotary buffing pad or the like, comprising:

an air blow gun having;

a hollow handle portion with an air inlet fitting thereon for flowing pressurized air from a source thereof into said handle portion,

a hollow barrel portion extending from an upper end portion of said handle portion at an angle relative thereto and having an internally threaded open discharge end for discharging pressurized air from within said barrel portion, and

a trigger portion operative to selectively initiate and terminate pressurized air flow from the interior of said handle portion into the interior of said barrel portion;

a support yoke member having;

a base portion having opposite ends, and an inner side surface facing in a first direction,

a pair of parallel yoke arms projecting outwardly in said first direction from said opposite base portion ends, said yoke arms having outer ends,

an externally threaded cylindrical boss portion extending outwardly from a central portion of said base portion in a second direction opposite from said first direction, said boss portion having an outer end surface and being threaded into said discharge end of said barrel portion of said air blow gun, and

an opening extending from said inner side surface of said base portion to said outer end surface of said boss portions;

a coaxially disposed, mutually spaced plurality of generally circular, peripherally toothed cleaning spur members positioned and secured between said outer ends of said yoke arms for rotation relative to said support yoke member about an axis perpendicular to said yoke arms, said spaced plurality of cleaning spur members collectively having a radially outer peripheral portion spaced transversely outwardly from said yoke arms; and

an open-ended air discharge flow tube having an inner end portion captively retained in said opening, and a discharge end positioned adjacent and generally directed toward said radially outer peripheral portion of said spaced plurality of cleaning spur members.

4,959,929

TOOL INSERT

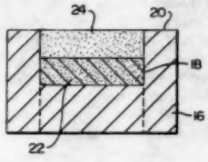
Richard P. Burnand, 39 Constantia Avenue, Alan Manor, Johannesburg, Transvaal, South Africa, and John Dodsworth, 1 Manor Close, Trimdon Village, County Durham, United Kingdom

Filed Dec. 23, 1987, Ser. No. 137,069

Claims priority, application South Africa, Dec. 23, 1986, 86/9663

Int. Cl.[5] B22F *3/14*

U.S. Cl. 51—307 **14 Claims**



11. A method of making a tool insert of the type comprising a diamond abrasive compact, a cemented carbide support and an intermediate layer, the method including the steps of providing a body of cemented carbide, placing a mixture of cubic boron nitride particles, carbide particles and powdered bonding metal on a surface of the carbide body, the cubic boron nitride particles constituting 60 to 20 percent by volume of the mixture, the carbide particles and bonding metal together constituting 40 to 80 percent by volume of the mixture and the bonding metal constituting 15 to 25 percent by weight of the carbide/metal combination, placing a mixture of diamond particles and powdered diamond solvent on the cubic boron nitride containing mixture, and subjecting the body and mixtures to conditions of elevated temperature and pressure suit-

able to produce the diamond abrasive compact of the diamond-/solvent mixture.

4,959,930

WASHING MACHINE

Katsuji Tsutsumi, 130-2, Fukimae, Makishimacho, Uji-Shi, Kyoto 611, Japan

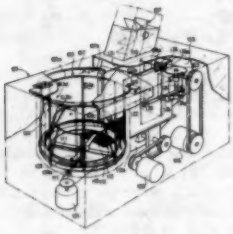
PCT No. PCT/JP87/00213, § 371 Date Dec. 7, 1987, § 102(e) Date Dec. 7, 1987, PCT Pub. No. WO87/06172, PCT Pub. Date Oct. 22, 1987

PCT Filed Apr. 6, 1987, Ser. No. 143,853

Claims priority, application Japan, Apr. 7, 1986, 61-51885; Dec. 17, 1986, 61-302619

Int. Cl.[5] B24C *3/04*

U.S. Cl. 51—426 **16 Claims**



1. A washing machine comprising:
- a washing chamber to receive an object to be cleaned having an outer casing with an opening;
- a lid member for opening and closing the opening in the outer casing;
- a centrifugal blasting means, including individual shots having relatively low hardness, for projecting shots against the object;
- means for applying a cleaning solvent to said shots;
- recovery means for recovering the discharged shots from said centrifugal blasting means;
- a safety shutter displaceably provided between said centrifugal blasting means and said washing chamber for movement between an open position which allows passing of the shots discharged from said centrifugal blasting means and a closed position which shuts off passing of said shots;
- a movable member provided in the vicinity of said opening of the outer casing so as to be depressed by the open/close lid member during closing thereof;
- a connecting mechanism provided between said movable member and said safety shutter so as to displace said safety shutter from the closed position to the open position thereof in association with the movement by the depression of said movable member, and
- a biasing means for restoring said safety shutter from the open position to the closed position.

4,959,931

METHOD AND APPARATUS FOR PREVENTING BINDING AND OVERLOADING OF MEDIA FEED SCREW CONVEYOR

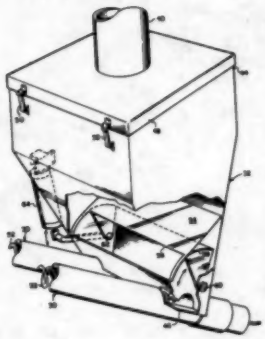
Roger A. Howells, Orefield, Pa., assignor to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Sep. 26, 1989, Ser. No. 412,960

Int. Cl.[5] B24C *7/00*

U.S. Cl. 51—436 **1 Claim**

1. A closed system for storing, feeding, recover and recycling blast media recovering from a blast treating chamber operated at cryogenic temperatures for use said blast treating chamber comprising in combination:
- a closed storage hopper having a first end adapted to receive new blast media or blast media recycled from said blast treating chamber and a second end adapted to dispense said blast media, said first end of said storage hopper having a generally rectangular first portion extending toward said second end transitioning to a generally trapezoidal second portion extending toward and communicating with, a feeding device comprising at least one auger or screw conveyor mated to said storage hopper to receive said blast media for conveying said blast media to said blast treating chamber;
- a baffle disposed in said storage hopper proximate said second end thereof said baffle having a closeable aperture and



constructed and adapted to direct blast media to said blast media feeding device; and an electrically actuated pneumatically operated damper to close said aperture in said baffle to prevent media from entering into said feeding device; and
- a cover removably positioned on said first end of said storage hopper adapted to effect a closed system to prevent ambient atmosphere from entering said hopper and to receive a recycled blast media conduit and media added manually.

4,959,932

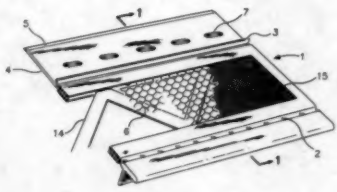
RAIN GUTTER SCREEN

Lee W. Pfeifer, 3137 Sweetwater Springs Blvd., Apt. 141, Spring Valley, Calif. 92098

Filed Aug. 11, 1989, Ser. No. 392,644

Int. Cl.[5] E04D *13/00*

U.S. Cl. 52—12 **1 Claim**



1. A rain gutter screen apparatus comprising:
- a. a first section connected to one end of a second section by a first hinge and a third section connected to an other end of the second section by a second hinge;
- b. the first section comprising:
  - a horizontal member; an upwardly extending vertical segment on the horizontal member parallel to an edge of the second section to place the second section at a fixed

distance from a lower edge of a roof; and a plurality of fastening orifices in the horizontal member;

c. the second section comprising:

a rectangular screen frame; at least two connecting pins in the screen frame to fasten at least one screen frame to another screen frame; a screen securing chamber in the frame; a screen assembly having a first screen of heavy wire and a large mesh openings, a second screen of lighter wire with smaller mesh openings and a reinforcing member to support the first and second screens; and a portion of the periphery of the screen assembly being inserted into and secured in place by the chamber; and

d. the third section comprising: a horizontal member; a continuous longitudinal array of ports in the horizontal member; and an attachment means on the horizontal member to clamp the third section to a rain gutter.

4,959,933

CABIN UNIT ARRANGEMENT

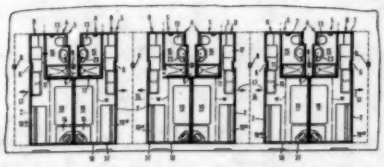
Erkki Lappi, Espoo, Finland, assignor to Wärtsilä Meriteollisuus Oy, Helsinki, Finland

Filed May 20, 1988, Ser. No. 196,976

Claims priority, application Finland, May 27, 1987, 872341

Int. Cl.[5] B63B *29/02*; E04B *1/348*

U.S. Cl. 52—79.7 **16 Claims**



1. A method for installing a cabin in a ship of the like, comprising the steps of:

(a) fabricating a transport unit at a fabrication site, the transport unit comprising first and second self supporting major parts each including two end wall portions and a side wall extending between the end wall portions, the side walls of the two major parts being insubstantially parallel opposed relationship and the end wall portions of the first part being at substantially the same distance from each other as the end wall portions of the second part,

(b) transporting the transport unit from the fabrication site to an installation site,

(c) separating said major parts of the transport unit while maintaining the side walls in substantially parallel opposed relationship, and

(d) installing wall members between the end wall portions of the two major parts.

4,959,934

ELASTO-PLASTIC DAMPER FOR USE IN STRUCTURE

Toshikazu Yamada; Takuji Kobori; Mitsuo Sakamoto; Shozo Maeda, and Shinichi Takahashi, all of Tokyo, Japan, assignors to Kajima Corporation, Tokyo, Japan

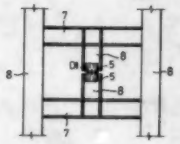
Filed Jan. 24, 1989, Ser. No. 301,317

Claims priority, application Japan, Jan. 27, 1988, 63-16229; Feb. 5, 1988, 63-25316; Feb. 17, 1988, 63-034823; Apr. 20, 1988, 63-97903; Apr. 20, 1988, 63-97904

Int. Cl.[5] E04H *9/00*

U.S. Cl. 52—167 R **27 Claims**

1. An elasto-plastic damper for connecting spaced apart opposed ends of cantilevered axially aligned structural members of a building to attenuate seismic vibrations of the building comprising: a flat sided substantially rectangular damper member; bolt holes provided in at least one pair of opposed edges of the damper member positioned to align with corresponding bolt holes in the said opposed ends of said cantilevered structural members, said bolt holes being adapted to receive bolts therethrough to secure said damper member to the said opposed ends of said cantilevered structural members; a plurality of open spaces in said damper member aligned to provide



predetermined elasto-plastic yield along a predetermined yield line of said damper member when said opposed ends of said cantilevered members are caused to shift due to seismic vibrations.

4,959,935

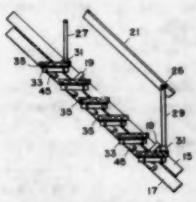
ADJUSTABLE STAIRWAY

H. Richard Stob, 1954 Hall St., S.E., Grand Rapids, Mich. 49506

Filed Sep. 25, 1989, Ser. No. 411,922

Int. Cl.[5] E04F *11/00*

U.S. Cl. 52—183 **8 Claims**



1. A stairway having a plurality of steps that can be simultaneously adjusted to the horizontal plane regardless of the angle of inclination of the stairway comprising:

a top stringer for each side of said stairway;

a bottom support stringer for siidably supporting each top stringer on each side of said stairway;

a plurality of spaced opposed brackets pivotally fastened to each top stringer;

a link connecting each opposed bracket on each of said top stringers to said bottom support stringer;

a plurality of steps, each step of said plurality of steps being mounted on a pair of said spaced opposed brackets on each of said top stringers;

at least one guide attached to each of said bottom supports for maintaining said top stringers in sliding alignment with said bottom support;

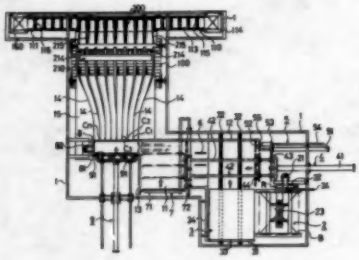
whereby said stairway can be placed at any desired angle of inclination and each step of said stairway can be simultaneously adjusted to the horizontal plane by sliding said top stringer on said bottom support stringer.

4,959,936

APPARATUS FOR PACKING BEAN CURD PIECES

Zenji Nagata, Yamatotakada, Japan, assignor to Sanyo Shokuhin Kabushiki Kaisha, Nara, Japan

Division of Ser. No. 215,416, Jul. 5, 1988, Pat. No. 4,920,844. This application Feb. 13, 1989, Ser. No. 310,597
Claims priority, application Japan, Jul. 2, 1987, 62-166042; Jul. 6, 1987, 62-168250
Int. Cl.[5] B65B *3/04, 5/08, 39/00, 55/22*
U.S. Cl. 53—252 7 Claims



1. An apparatus for placing bean curd pieces in packs, comprising:

a tank adapted to hold water at least up to a water level;

guide plate means for receiving bean curd pieces, said guide plate means being mounted within said tank at least partially below said water level;

a conveyor, said conveyor including guide rail means to maintain packs on said conveyor despite the buoyancy of the packs, said conveyor being mounted for substantially vertical movement between raised and lowered positions, an uppermost portion of the packs being proximate said water level when said conveyor is in said raised position, and proximate said guide plate means when said conveyor is in said lowered position;

means for driving said conveyor, said means for driving being connected to said conveyor;

means for moving said conveyor between said raised and lowered positions, said means for moving being connected to said conveyor; and

pushing means for contacting and moving the bean curd pieces, below said water level, through said guide plate means to positions above respective ones of the packs on said conveyor, said pushing means being within said tank.

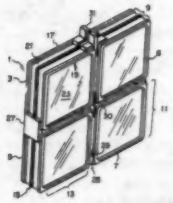
4,959,937

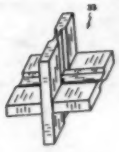
GLASS BLOCK PANEL CONSTRUCTION AND DEVICE FOR USE IN SAME

Mayer, Emil, 30 Timber La., Manhasset, N.Y. 11030

Continuation-in-part of Ser. No. 863,664, May 15, 1986, Pat. No. 4,774,793, which is a continuation-in-part of Ser. No. 843,483, May 14, 1986, abandoned. This application Oct. 4, 1988, Ser. No. 253,008
Int. Cl.[5] E04G *21/18*
U.S. Cl. 52—308 36 Claims

1. A connector for glass blocks for use in forming a panel of said blocks, comprising a pair of rigid, interlocked, elongated, rectilinear members each member having but two spaced, parallel planar opposite surfaces, a longitudinal groove in each surface, and an open slot perpendicular to the longitudinal direction and extending to the lateral center of the member, the slot of each member being interlockably disposed within the slot of the other member, said connector being further characterized in that each member is adopted to extend no further than the center of a side of a block on which said member abuts.



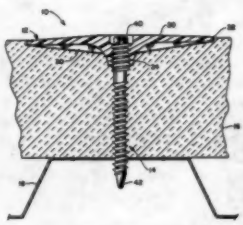


4,959,938

NON-SEATING PLATE/FASTENER ASSEMBLY

Charles J. De Caro, 6530 Havenlock Pl., Charlotte, N.C. 28215

Filed Aug. 28, 1989, Ser. No. 399,598
Int. Cl.[5] E04B *5/00*
U.S. Cl. 52—410 19 Claims



1. A fastener/plate assembly for fastening material to a substrate comprising:

plate means comprising a plate having a hub portion defining a central axial opening having a pre-established diameter;

fastener means comprising a drive means at a proximal end and a distal end and a shank having two thread sections, one section adjacent said distal end having a first thread with a maximum thread diameter less than the diameter of a said central opening, the other shank section having a second thread with a maximum thread diameter greater than the central opening diameter and dimensioned to self-tap into the hop portion and become threadedly engageable with said hub portion, so that said fastener means first thread is loosely insertable in said opening and upon suitably torqueably driving said driver means into a substrate, said second thread threadably engages said hub portion and wherein the assembly exerts a holding force against material disposed between said plate and substrate

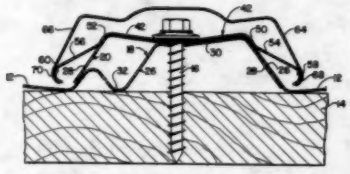
which holding force substantially consists of composite forces exerted through said first and second threads.

4,959,939

BUILDING PANEL MOUNTING SYSTEM

Robert H. Buchanan, Jr., Canton, Mich., assignor to National Steel Corporation, Pittsburgh, Pa.

Filed Sep. 26, 1989, Ser. No. 412,519
Int. Cl.[5] E04D *1/36*
U.S. Cl. 52—462 **11 Claims**



1. A wall panel assembly for an external building roof or wall including a plurality of generally rectangular sheet metal panels each including a longitudinally extending outwardly projecting reinforcing rib adjacent each longitudinal side edge and at least one such rib intermediate said longitudinal side edges, said panels being disposed in parallel relationship with the reinforcing ribs on adjacent side edges of successive panels overlapping,

a plurality of headed fasteners penetrating each said panel along each said reinforcing rib to secure the panels to underlying building structure,

a plurality of batten strip mounting clips mounted on each said panel by said fasteners along each said reinforcing rib, and

an elongated batten strip mounted on said clips and extending along each said reinforcing rib concealing said headed fasteners and said clips and improving the watertight integrity of the building wall,

said reinforcing ribs being integrally formed from the building panel sheet metal and each including a pair of outwardly extending leg portions joined by a central web portion,

said mounting clips each including a central body portion having a fastener receiving opening extending therethrough and shaped complementary to the exposed outer surface of the central web, and a pair of arms extending one along each edge of the body portion, said arms each including a first portion extending along and contacting the outer surface of the underlying reinforcing rib leg adjacent said central web and a second portion inclined outwardly from the reinforcing rib leg, said arms terminating in a free end spaced from the building panel and from the reinforcing rib,

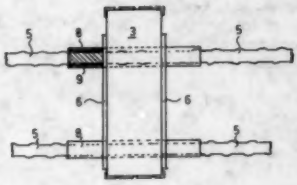
said batten members each including an elongated generally channel shaped member having a central crown and a pair of integrally formed, generally opposed, spaced flanges, said flanges terminating in an inwardly directed free edge portion forming a channel, said flange free edges being normally spaced apart a distance less than the spacing of said arm free ends and adapted to be snapped thereover whereby said batten strips may be mounted on the clips by asserting a compressive force deflecting the mounting clip arms inwardly to snap into interlocking relationship with the channel on the batten strip flanges.

4,959,940

CANTILEVER PLATE CONNECTING ASSEMBLY

Heinz Witschi, Ortschwaben, Switzerland, assignor to Bau-Box Ewiag, Oberdiessbach, Switzerland

Filed Apr. 18, 1989, Ser. No. 339,678
Claims priority, application Switzerland, Apr. 22, 1988, 1505/88
Int. Cl.[5] E04C *2/06*
U.S. Cl. 52—583 **5 Claims**



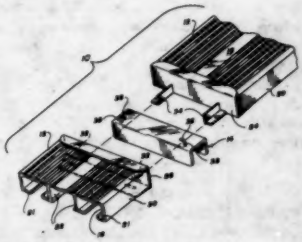
1. A cantilever plate connecting assembly for the insulated, closed-linkage joining of a floor-ceiling plate (2) to a cantilever plate (1), having a slab-form insulation body (3) therebetween and reinforcing bars (5) extending through the insulation body (3) comprising at least two in vertical arrangement one over another and being held by face plates on both sides of the insulation body (3), said face plates (6) being made of corrosion-resistant material, and wherein the reinforcing bars (5), at least in the portion thereof extending through the insulation body (3), are surrounded with corrosion-resistant sheaths (8), wherein a space is formed between each sheath (8) and reinforcing bar (5), said space being filled with a hardening composition (9) which has a greater hardness than concrete, and the sheaths (8) extend through the face plates (6).

4,959,941

PLATFORM CONSTRUCTION

Carl M. Schoeneberg, 2025 Schoettler Valley, Chesterfield, Mo. 63017

Filed Dec. 5, 1989, Ser. No. 446,437
Int. Cl.[5] E04C *2/42*
U.S. Cl. 52—664 **12 Claims**



3. A platform construction having a plurality of vertical support frames laterally joined with cross braces, the vertical support frames having horizontal supports for planking with an upstanding hook with a shank attached to the horizontal support generally longitudinal thereto, planking formed from a channel with a top, downwardly turned sides and an open end and having male and female endcaps, said male and female endcaps formed from a channel having a bottom with inwardly turned upper and lower sides, the upper side overlying the top of the channel forming the planking and the lower side overlying the open end thereof, a projection longitudinal to the planking attached to the lower side of the male endcap and passing through an aperture in the bottom thereof, an aperture in the lower side of the female endcap for receipt of the hook,

an aperture in the bottom of the female endcap for receipt of the projection, a portion of which passes underneath the hook thereby locking male and female endcaps to the horizontal support in three dimensions.

4,959,942

METHOD AND SYSTEM FOR PREPARING AN EXHIBITION SPACE

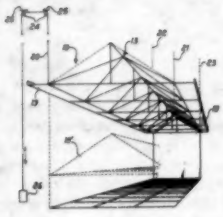
Anna Olewska, Krakow, Poland, assignor to Dolmen Engineering & Systems Ltd., Great Britain

Continuation of Ser. No. 141,568, Jan. 6, 1988, abandoned. This application Nov. 6, 1989, Ser. No. 432,360

Claims priority, application European Pat. Off., Jan. 8, 1987, 87100168.1

Int. Cl.[5] **E04G** *21/00*

U.S. Cl. 52—745 **4 Claims**



1. A method for preparing an exhibition space within a roof enclosure containing a floor and a plurality of exhibition stands and passages between said plurality of exhibition stands comprising:

a. providing a plurality of supporting frames at locations within said roof enclosure substantially corresponding only to said passages, each of said plurality of supporting frames being independently supported from said roof enclosure by means of adjustable cable means whereby said plurality of supporting frames can be independently raised and lowered;

b. removably fixing mountable means to said plurality of supporting frames at predetermined locations on said plurality of supporting frames corresponding to predetermined positions in said passages, said mountable means being selected from the group consisting of ceiling elements, signalling elements, and lighting elements

c. raising said plurality of supporting frames to an elevated standby position proximate to said roof enclosure; and

d. lowering said plurality of supporting frames to an operating position at a predetermined distance from the floor of said exhibition space corresponding to said passages.

4,959,943

CAPSULE CHARGING APPARATUS

Taizo Yamamoto, Osaka, and Masakiyo Inoue, Nara, both of Japan, assignors to Nippon Elanco Kabushiki Kaisha, Osaka, Japan

Filed Mar. 10, 1989, Ser. No. 321,984

Claims priority, application Japan, Mar. 11, 1988, 63-59107

Int. Cl.[5] **B65B** *1/04, 7/28*

U.S. Cl. 53—282 **5 Claims**

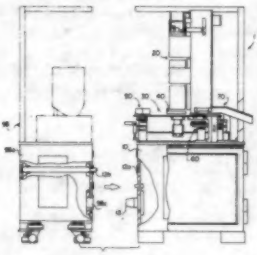
1. A capsule charging apparatus including a capsule conveying device housing a driving unit, and a capsule charging device, the capsule conveying device carrying a plurality of capsules each of which has its body portion inserted into its cap portion, in an erected posture with the cap portion on top and the body portion downwards, the capsules being separated into the cap portions and the body portions so that the body portions are charged with a content, wherein:

the capsule conveying device is disposed on a first stand accommodating at least one driving unit;

the capsule charging device is disposed on a second stand;

wherein the first stand comprises first positioning means and the second stand comprises second positioning means, the first means being engageable with the second means so that the capsule charging device is positioned at its working position with respect to the first stand;

wherein the first stand comprises first coupling means and the second stand comprises second coupling means, the



first coupling means being engageable with the second coupling means; and

a first power transmission line housed in the first coupling means, and a second power transmission line housed in the second coupling means, the first and second transmission lines being connectable to each other, the first and second power transmission lines being connected to the driving unit housed in the first stand.

4,959,944

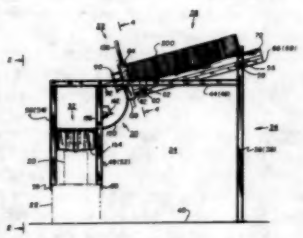
SEPARATING, FEEDING, AND METERING OF A RANGE OF COVERS WITHOUT THE NEED FOR INTERMEDIATE ADJUSTMENT

Raymond A. Heisler, 657 Dakota Trail, Franklin Lakes, N.J. 07417

Filed Nov. 17, 1989, Ser. No. 437,833

Int. Cl.[5] **B65B** *7/28;* **B67B** *3/062*

U.S. Cl. 53—313 **24 Claims**



1. An improved apparatus for separating, feeding, metering, and placing of a preformed cover onto a traveling preformed container, said preformed cover being a first and lowermost cover of a nested stack, said apparatus including:

(a) a main frame assembly;

(b) an inclined hopper assembly adjustably mounted on said main frame assembly, said hopper assembly adapted for advancing said nested stack of covers towards a cover separating assembly;

(c) said cover separating assembly carried on a lowermost end of said hopper assembly, said cover separating assembly including, a frame member carrying a first clamping means, a second clamping means, and a cover separating means, said first clamp means and second clamp means sequentially actuated for retaining at least a second of the

preformed covers in the nested stack, said first clamp and second clamp cooperating to retain said second cover and subsequent covers from advancing down said inclined hopper during a selected period, said cover separating means adapted to separate said first cover from said retained second cover, and said cover separating means further adapted to release said first cover at a selected time.

(d) a first sensing means for determining the clamping of a top portion of the second cover by said first clamp independent of the distance traveled by said first clamp, said determination of said first sensing means providing actuation of the second clamp, a second sensing means for determining the full clamping of a bottom portion of the second cover by the second clamp, independent of a distance traveled by the second clamp, said determination of said second sensing means providing for the actuation of the cover separating means for separating said first cover from said second cover.

(e) a transfer chute assembly carried on said frame member of the cover separating assembly, said transfer chute assembly including a curved transfer chute adapted for accepting said first cover released by said cover separating means, said curved chute adapted for rotating said first cover, advancing by gravity thereon, from a substantially vertical disposition to a substantially horizontal disposition;

(f) an elongated inclined chute pivotly mounted to said main frame assembly, said inclined chute having a first end, a discharge end, and a means for limiting the pivoting extents of the inclined chute, said first end adapted to receive said first cover advancing horizontally from said transfer chute assembly, said inclined chute adapted for advancing said first cover, by gravity, from said first end to the discharge end;

(g) a placing assembly mounted at and on said discharge end of the inclined chute, said placing assembly adapted to guide and subsequently stop advancement of said first cover in substantially centered alignment with said traveling container, said placing assembly further providing a means for engaging a leading edge of the traveling container with a mating portion of the first cover, said placing assembly further adapted for releasing said first cover onto said traveling container;

(h) said hopper assembly, said cover separating assembly, said transfer chute assembly, said inclined chute, and placing assembly adapted for an initial adjustment for a selected range of preformed cover sizes of a substantially like design; and said hopper assembly, said cover separating assembly, said transfer chute assembly, said inclined chute, and said placing assembly separating, feeding, metering, and placing any size preformed cover, within said selected range of covers, from said nested stack after and only with said initial adjustment.

4,959,945

FOLDER

Michael L. Rooyakkers, Kimberly, and Ken E. Harvey, Green Bay, both of Wis., assignors to Valley Tissue Packaging, Inc., Green Bay, Wis.

Filed Aug. 15, 1989, Ser. No. 394,015
Int. Cl.[5] B65B *7/02*
U.S. Cl. 53—378 **17 Claims**

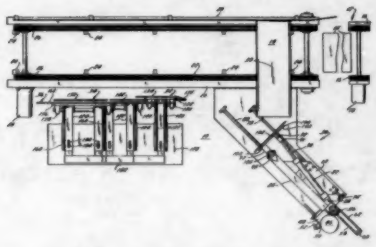
1. A machine for folding onto the end of an object having a generally rectangular cross section, an overwrap sheet material which covers at least three sides of said object and extends from at least one end of said object in such a manner that top and bottom generally horizontal flaps and two generally vertical side flaps remain to be folded onto said end, said machine comprising:

means for conveying said object along a path from an upstream first end to a downstream second end;

means for positioning said object so that said flaps are directed transversely of said conveyor means;

reciprocating rear flap folder means for moving toward and away from said conveyor means and folding onto said end of said object the upstream one of said side flaps;

means located downstream of said reciprocating means for folding onto said end of said object the remaining three



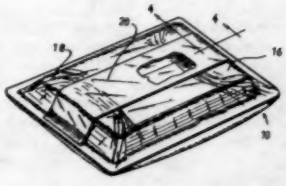
flaps, said folding means comprising three substantially stationary vertical plate means arranged adjacent said conveyor means for engaging said three flaps as said object moves in a downstream direction to press said flaps inwardly onto said end, said vertical plate means being secured to the machine to permit limited movement of said vertical plate means with respect to said conveyor means.

4,959,946

FILM WRAPPED RECEPTACLE

Joseph S. Doyle, Williamsburg, Va., assignor to Eastern Shore Printing Corp., Ashland, Va.

Continuation-in-part of Ser. No. 207,178, Jun. 15, 1988, abandoned. This application Sep. 15, 1989, Ser. No. 407,530
Int. Cl.[5] B65B *53/02, 51/04*
U.S. Cl. 53—415 **13 Claims**



1. A method for wrapping and sealing a preformed package having at least one substantially flat surface, comprising:

tightly wrapping a flexible, plastic film about said preformed package such that said film defines a pair of opposing flaps and a lap area extending between said flaps, said flaps and said lap area being formed adjacent to said substantially flat surface of said preformed package, and said film being folded upon itself a number of times in the area of said flaps, thereby forming a substantial number of wrinkles;

applying heat and pressure to said flaps and lap area of said film, thereby flattening said flaps and lap area into conformity with said substantially flat surface of said preformed package;

applying a strip of adhesive tape to said film such that said strip connects said flaps to each other and overlies said lap area, thereby restricting movement of said film with respect to either said preformed package or to itself, and

applying heat to said strip of adhesive tape, thereby causing at least some of said adhesive to flow towards said film and into at least some of said wrinkles.

4,959,947

EQUIPMENT FOR MAKING AND PACKING A MULTIPLE-CONSTITUENT MIXTURE

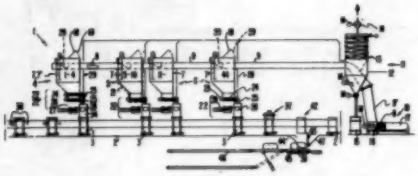
Werner Reif, Ravensburg, Fed. Rep. of Germany, assignor to Motan Verfahrungstechnik GmbH & Co., Weingarten, Fed. Rep. of Germany

Filed May 9, 1989, Ser. No. 349,230

Claims priority, application Fed. Rep. of Germany, May 11, 1988, 3816202

Int. Cl.[5] **B65B** *1/32, 7/00*

U.S. Cl. 53—502 **16 Claims**



1. A system for the production and packaging of a compound mixture from individual components of powdered fill material, comprising:

a plurality of transport vessels, each transport vessel having means for retaining a container for receiving and holding a compound mixture;

a transport means for transporting each one of said plurality of transport vessels;

a timing means operatively connected to said transport means for causing said vessels to be transported in a predetermined sequence; and

a plurality of feed vessels, each one of said plurality of feed vessels including:

a receptacle for receiving and storing an individual component of powdered fill material;

an individual powdered fill material component discharge, weighing, and transfer means disposed adjacent to said receptacle for discharging, weighing, and transferring a predetermined amount of an individual component of powdered fill material from said receptacle into a container received in one of said transport vessels; and

electronic control means operatively connected to said discharge, weighing, and transfer means for regulating and determining the amount of material discharged from said feed vessel into a container as a function of the weight and of the individual physical properties of the individual powdered fill material discharged; and

a closing device for closing a container having a compound mixture from a plurality of individual components of fill material therein.

4,959,948

FIBER BALING PRESS

Gerold Fleissner, Chur, Switzerland, assignor to Fleissner Maschinenfabrik AG, Rebstein/Schweiz, Fed. Rep. of Germany

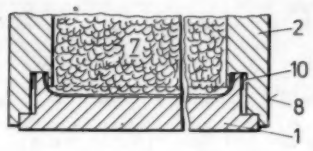
Filed Sep. 26, 1988, Ser. No. 249,296

Claims priority, application Fed. Rep. of Germany, Sep. 25, 1987, 3732390

Int. Cl.[5] **B65B** *1/26, 13/20;* **B30B** *5/00*

U.S. Cl. 53—528 **11 Claims**

1. A fiber baling press comprising a press box comprised of a press box casing that is closed all around and a press platen that can be covered with a sheet-like piece of packaging material, said press platen having means for aligning the piece of packaging material, said means including a trough with wall portions projecting all around with respect to the bottom of the trough; a bottom plate of said press box comprising said press platen, said plate being detachably joined to the press box casing and having an upper portion defining said trough with a cross-sectional area larger than the cross-sectional area of an interior space defined by the press box casing; a lower end of an inner wall of the press box casing extending into the trough and a lower end of an outer wall of the press box casing extending beyond the trough to contact a flange portion of the bottom plate.



4,959,949

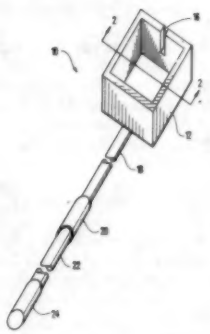
FRUIT PICKER

Edward J. Wier, 1565 Carew St., Springfield, Mass. 01104

Filed Nov. 15, 1989, Ser. No. 436,734

Int. Cl.[5] **A01D** *46/24*

U.S. Cl. 56—328.1 **6 Claims**



1. A fruit picker, comprising:

a rectangular receptacle having an open top and a hollow interior;

said receptacle including four vertical side walls joined by horizontal floor;

a vertical slot formed in a top end one of said side and

an elongated handle secured to said receptacle.

4,959,950

HARVESTER FOR GRAPES

Desmond C. Burke, Victoria, Australia, assignor to U.R. Engineering Pty. Ltd., Mildura, Australia

Filed Oct. 19, 1989, Ser. No. 424,132

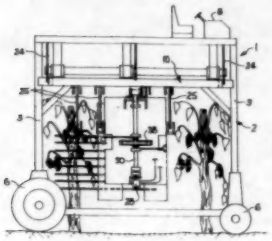
Claims priority, application Australia, Oct. 19, 1988, PJ1050

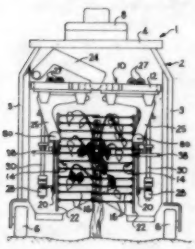
Int. Cl.[5] **A01D** *46/26*

U.S. Cl. 56—340.1 **16 Claims**

1. A picking head suitable for use with a harvester, the harvester including a mobile carriage, the picking head comprising a support frame having a support frame axis which in the operative position extends generally in the same direction as the normal line of travel of the harvester, link means operatively connected to the mobile carriage of harvester when in the operative position, said link means permitting lateral vibrational movement of said support frame with respect to the direction of said support frame axis said support frame being

adapted to have secured thereto harvesting elements which, in the operative position are secured to said support frame so that





the lateral vibrational movement of said support frame causes lateral vibrational movement of the harvesting elements.

4,959,951

YARN GUIDE DEVICE FOR A TWO-FOR-ONE TWISTER

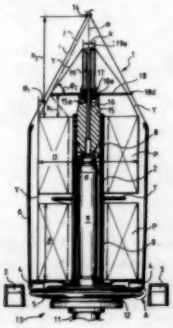
Shigeki Mori, Ohtsu, Japan, assignor to Murata Kikai Kabushiki Kaisha, Kyoto, Japan

Filed May 22, 1989, Ser. No. 354,925

Claims priority, application Japan, May 24, 1988, 63-12634

Int. Cl.[5] D01H *7/86, 13/04*

U.S. Cl. 57—58.52 **8 Claims**



1. In a two-for-one twister operable to unwind yarn from first and second yarn packages supported on a spindle provided with a spindle bore, the yarn packages each having an outside diameter, a yarn guide comprising:

a guide pipe for guiding yarns unwound from the yarn packages into the spindle bore, the guide pipe having an opening for receiving yarns unwound from the yarn packages;

rotatably supported ring member disposed above the yarn packages between the opening of the guide pipe and an upper end face of the first package, the ring member having an outside diameter which is less than the outside diameter of the first and second yarn packages before the unwinding operation is performed on the packages,

wherein the yarns unwound from the yarn packages run in sliding contact with the outer circumference of the ring member and are guided into the bore of the spindle.

4,959,952

OPERATION STARTING METHOD FOR SPINNING MACHINE

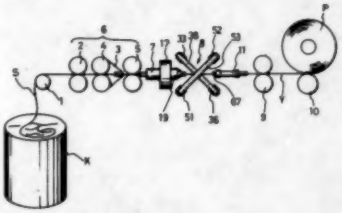
Hisaaki Kato, Shiga; Hiroshi Yamaguchi, Kyoto; Hideshi Mori, Joyo, and Akira Shimano, Kyoto, all of Japan, assignors to Murata Kikai Kabushiki Kaisha, Kyoto, Japan

Filed Apr. 20, 1988, Ser. No. 183,976

Claims priority, application Japan, Apr. 22, 1987, 62-99450; Jun. 4, 1987, 62-140607; Jul. 6, 1987, 62-104273; Dec. 29, 1987, 62-334202

Int. Cl.[5] D01H *15/00, 1/115*

U.S. Cl. 57—261 **16 Claims**



1. An apparatus for producing spun yarn from a fiber bundle, the apparatus comprising:

a draft device including back rollers, middle rollers and front rollers,

a first air jetting nozzle operable for causing a whirling air flow to act upon the fiber bundle to whirl the fiber bundle,

a false twisting device having two belts operable for nipping and false twisting the fiber bundle between the two belts, the belts being arranged to travel in an intersecting relationship in different directions from each other, the belts being disposed along a path of travel of the fiber bundle,

a shield member for inhibiting an air flow jetted from said first nozzle from reaching said false twisting device, the shield member being provided between the first nozzle and the false twisting device, and

a second air jetting nozzle provided between the shield member and said false twisting device, the second nozzle having a fiber bundle path,

wherein the shield member is provided with an opening on the second nozzle side of the shield member, the opening being formed small and wherein an air jetting hole directed toward said false twisting device is provided in the fiber bundle path of the second nozzle in communication with said opening.

4,959,953

FUNNEL FOR A SPINNING MACHINE

Stefan Krawietz, Ebersbach/Fils, Fed. Rep. of Germany, assignor to Zinser Textilmaschinen GmbH, Fed. Rep. of Germany

Filed Nov. 30, 1988, Ser. No. 277,858

Claims priority, application Fed. Rep. of Germany, Dec. 8, 1987, 3741432

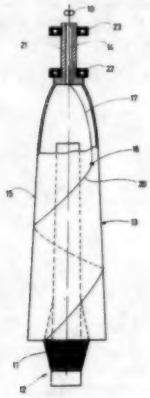
Int. Cl.[5] D01H *7/18, 1/06, 1/42, 7/66*

U.S. Cl. 57—354 **4 Claims**

1. In an apparatus for delivering yarn for building a package on a spindle of a spinning machine, a funnel comprising:

a neck portion defining a yarn entry channel and a coaxial annular funnel body portion defining an open interior area

communicating at one end of said funnel body portion with said entry channel of said neck portion and open at the opposite end of said funnel body portion for receiving said spindle, said funnel body portion defining a yarn exit opening at an axial spacing from said entry channel of said neck portion and having an exterior yarn guide surface extending axially from said yarn exit opening to said opposite end of said funnel body portion, said yarn entry channel of said neck portion being adapted for delivering yarn into said interior area of said funnel body portion and said exit opening of said funnel body portion being adapted for passage of yarn from said interior area of said funnel body portion to said exterior yarn guide surface thereof, said yarn entry channel being of a sufficiently constricted



cross-section for the passage of yarn therethrough in a substantially longitudinal path into said interior area of said funnel body portion, said interior area of said funnel body portion being of a sufficiently enlarged cross-section in relation to said entry channel of said neck portion and in relation to said spindle and said exit opening of said funnel body portion being sufficiently spaced from said yarn entry channel of said neck portion for causing yarn to balloon while traveling within said interior area of said funnel body portion between said entry channel of said neck portion and said exit opening of said funnel body portion, the cross-section of said interior area of said funnel body portion controlling the amount of yarn ballooning.

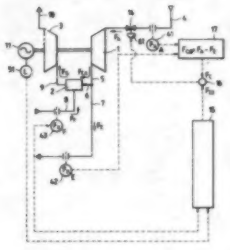
4,959,954

GAS TURBINE SYSTEM AND METHOD OF CONTROLLING THE SAME

Tsunemasa Nishijima, Hitachi, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 30, 1988, Ser. No. 277,950
Claims priority, application Japan, Dec. 9, 1987, 62-309627
Int. Cl.[5] F02C 7/057
U.S. Cl. 60—39.02 **2 Claims**

1. In a gas turbine engine of an extracting operation type wherein a part of discharge air from a compressor is extracted and released to another installation, while a remaining part of the discharge air is supplied to a gas turbine combustor as air for combustion, a method of controlling the gas turbine engine comprising the steps of detecting a load driven by said gas turbine engine, and controlling a flow rate of inlet air of said compressor by adjusting said flow rate of inlet air in depen-



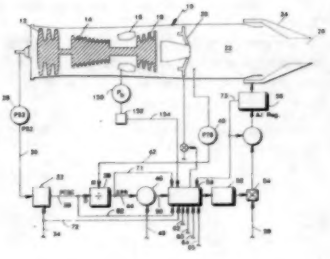
dence upon a flow rate of extraction air and a desired flow rate of combustion air evaluated from a detected load value.

4,959,955

METHOD OF OPERATING GAS TURBINE ENGINE WITH FAN DAMAGE

Gregory S. Patterson, Jupiter, and James B. Kelly, Lakeworth, both of Fla., assignors to United Technologies Corporation, Hartford, Conn.

Filed Feb. 27, 1989, Ser. No. 316,265
Int. Cl.[5] F02K 1/18
U.S. Cl. 60—204 **4 Claims**



1. A method of operating a gas turbine engine in a manner to accommodate fan damage comprising:

determining an actual EPR signal;

establishing an EPR error signal by comparing said actual EPR signal to an anticipated EPR signal;

establishing a fan damage signal, by comparing said EPR error signal to a tolerable EPR fan damage error, when said EPR error signal exceeds said tolerable EPR fan damage error;

comparing said EPR error signal to a pre-established nozzle area versus EPR error ratio relationship representing predicted stall limit with fan damage;

determining the presence of an immediately preceding stall; and

limiting the minimum area of the engine nozzle to a corresponding pre-selected nozzle area in the presence of both said fan damage signal and an immediately preceding stall.

4,959,956

ROBUST EXHAUST MANIFOLD

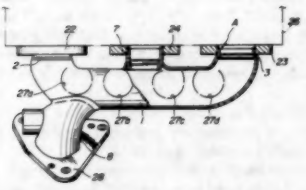
Makoto Yasuda, Yokohama, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Dec. 20, 1988, Ser. No. 286,830

Claims priority, application Japan, Dec. 21, 1987, 62-194685[U]

Int. Cl.[5] F01N 7/10

U.S. Cl. 60—323 13 Claims



1. An exhaust manifold for a multicylinder type internal combustion engine, comprising:

a plurality of branch tubes each having one end adapted to connect with an exhaust port of said engine;

a gas gathering tubular member of a selected diameter having said branch tubes connected to thereby to lead the exhaust gases produced by said engine thereinto through said branch tubes; and

an outlet tube connected to said gas gathering tubular member to discharge the gases therefrom,

wherein at least two of said branch tubes are integral with said gas gathering member and are provided by curving both end portions of a single metal tube such that said end portions are drawn to have a smaller diameter than said tubular member diameter.

4,959,957

HYDRAULIC ACTUATING UNIT, IN PARTICULAR FOR RAISING A LOAD, SUCH AS A HOSPITAL BED

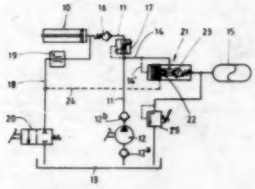
Fred W. Schmale, Denekamp, and Tone Oudelaar, Oldenzaal, both of Netherlands, assignors to Applied Power Inc., Milwaukee, Wis.

Filed Jun. 19, 1989, Ser. No. 368,036

Claims priority, application Netherlands, Jun. 28, 1988, 8801644

Int. Cl.[5] A61G 7/00

U.S. Cl. 60—413 3 Claims



2. In a hydraulic actuating unit for raising a load, and having a reservoir for hydraulic fluid, a hydraulic piston cylinder device the cylinder of which has its end connected to the reservoir through a supply conduit and a return conduit, said supply conduit containing a hydraulic plunger pump with suction and pressure valve means and said return conduit containing an orifice and a normally closed relief valve, a branch conduit leading to a hydraulic liquid accumulator and connected to the supply conduit at a location between the cylinder and the pressure valve means, a check valve in the supply conduit at a location between the branch conduit and the cylinder, a pressure dependent orifice disposed between the check valve and the branch conduit to the accumulator, the improvement wherein:

a multiple pilot operated check valve of the differential type is disposed in the branch conduit toward the accumulator, the check valve has a differential spool member the largest and smallest end faces of which are subject to the pressure in the branch conduit while the differential area of the spool member is subject to the pressure in a second branch conduit leading from the return conduit at a location between the orifice and the relief valve, whereby the pressure in the branch conduit to the accumulator tends to cause the spool member and thereby the check valve to open, whereas the pressure in the second branch conduit tends to move the spool member and valve into the closed position.

4,959,958

HYDRAULIC PRESSURE SYSTEM

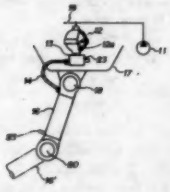
Masao Nishikawa, Tokyo; Masato Hirose, and Masaru Ozawa, both of Saitama, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

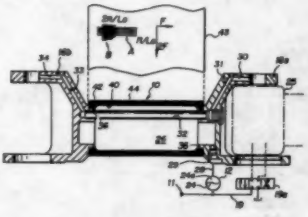
Filed Dec. 23, 1988, Ser. No. 289,930

Claims priority, application Japan, Dec. 30, 1987, 62-332721; Dec. 30, 1987, 62-332728; Dec. 30, 1987, 62-332729; Dec. 30, 1987, 62-332730

Int. Cl.[5] F16D 31/02

U.S. Cl. 60—415 5 Claims





1. A hydraulic pressure system for supplying a fluid under pressure, comprising:

a fluid pressure source for supplying the fluid pressure;

an accumulator for storing part of the fluid from said fluid pressure source, said accumulator having a gas chamber filled with a high-pressure gas for pressurizing the stored fluid; and

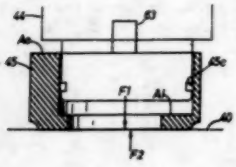
a structural member having a hermetically sealed space held in fluid communication with said gas chamber, said structural member comprising a link of an articulated mechanism and including a cylindrical metal tube extending between and connection yokes.

4,959,959

DISTRIBUTION RING IN HYDRAULICALLY OPERATED CONTINUOUSLY VARIABLE TRANSMISSION

Akihito Okuda; Yoshihiro Katagiri, both of Saitama, and Hiromi Aoki, Tokyo, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 8, 1988, Ser. No. 268,693
Claims priority, application Japan, Nov. 9, 1987, 62-282579
Int. Cl.[5] F16D *39/00*
U.S. Cl. 60—489 9 Claims



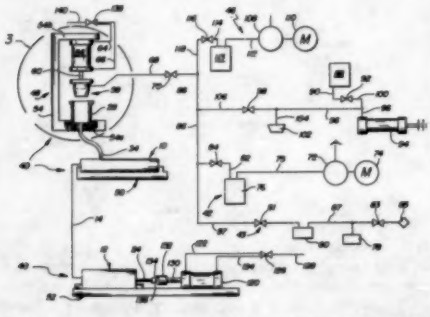
1. In a distribution ring in a hydraulically operated continuously variable transmission comprising a hydraulic motor of the variable displacement type having a motor cylinder coupled to an output shaft and including motor plungers slidably disposed respectively in a number of cylinder bores defined in an annular pattern surrounding the center of rotation of the motor cylinder, and a hydraulic pump coupled to an input shaft, said hydraulic motor and said hydraulic pump being interconnected by a closed hydraulic circuit, said distribution ring being relatively rotatably and slidably held against an end surface of said motor cylinder for successively switching the introduction of working oil into said cylinder bores and the discharge of working oil from said cylinder bores in response to rotation of said motor cylinder, the improvement comprising, said distribution ring having an asymmetrical hydraulic pressure bearing area for minimizing forces tending to tilt said distribution ring relative to said motor cylinder.

4,959,960

METHOD AND APPARATUS FOR PREFILLING HYDRAULIC CONTROL APPARATUS

Robert H. LaFountain, Rochester, Mich., assignor to Automotive Products plc, Warwickshire, England

Filed Oct. 17, 1988, Ser. No. 258,381
Int. Cl.[5] F15B *7/0*
U.S. Cl. 60—533 15 Claims



1. A method of filling a hydraulic apparatus of type including a slave cylinder; a conduit connected at one end to the inlet port of the slave cylinder; a master cylinder connected at its discharge port to the other end of the conduit; and a reservoir assembly including a reservoir body connected to the master cylinder and having an open top, a diaphragm positioned in the open top of the reservoir body and extending downwardly into the hollow of the reservoir body and a reservoir cap fitted over the open top of the reservoir body, said method comprising the steps of:

(A) providing a filling head having a nozzle portion having an exterior surface enclosing a volume approximating the volume enclosed by the exterior surface of said diaphragm;

(B) with said cap and diaphragm removed from said reservoir body, placing said filling head over the open top of said reservoir body with said nozzle portion extending downwardly into the hollow of said reservoir body;

(C) filling said hydraulic apparatus with hydraulic fluid through said nozzle portion of said filling head;

(D) removing said filling head from said reservoir body; and

(E) reinstalling said diaphragm and said cap on said reservoir body.

10. A filling apparatus for filling a hydraulic apparatus of the type including an open top reservoir connected to a master cylinder, said apparatus comprising:

a fixture for holding the reservoir in an upright position;

a unitary filling head having a main body portion defining an annular downwardly facing sealing surface sized to match an annular sealing surface adjacent the open top of the reservoir and a nozzle portion rigid with said sealing surface and extending downwardly from said main body portion within said sealing surface to a location spaced below said sealing surface so as to extend into the hollow of the reservoir with said filling head sealing surface sealingly engaging the reservoir sealing surface;

means for moving said filling head between a rest position removed from the reservoir and a filling position in which said filling head sealing surface sealingly engages the reservoir sealing surface and said nozzle portion extends downwardly into the hollow of the reservoir; and

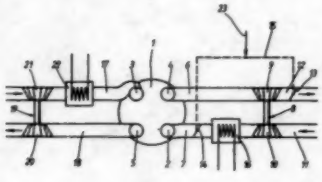
a passage in said unitary filling head extending from an entry end opening in the exterior of said head above said sealing surface to an exit end opening in the exterior of said filling head below said sealing surface.

4,959,961

SUPERCHARGED INTERNAL COMBUSTION ENGINE

Hermann Hiereth, Esslingen, Fed. Rep. of Germany, assignor to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed May 4, 1989, Ser. No. 347,055
Claims priority, application Fed. Rep. of Germany, May 10, 1988, 3815991
Int. Cl.[5] F02B *37/00*
U.S. Cl. 60—612 8 Claims



1. Supercharged internal combustion engine in which two inlet ducts, each of which can be closed by an inlet valve, and two exhaust ducts, each of which can be closed by an exhaust valve, enter a combustion space and in which one inlet duct and one exhaust duct are connected to a compressor and turbine, respectively, of a first exhaust gas turbocharger and the other inlet duct and exhaust duct are connected to a compressor and turbine, respectively, of a second exhaust gas turbocharger, the two inlet ducts being arranged so that flows therethrough are separate from one another and the two exhaust ducts being arranged so that flows therethrough are separate from one another, wherein one of the first and second exhaust

gas turbochargers has an inlet and an outlet, and a shut-off element operatively associated with the inlet and outlet selectively shuts off the inlet and outlet.

4,959,962

STARTER SYSTEM FOR AUTOMATICALLY TURNING OFF AND RESTARTING A MOTOR VEHICLE ENGINE

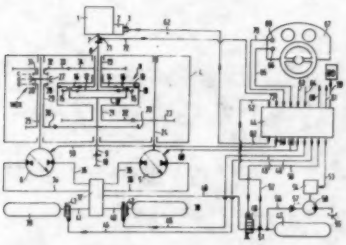
Faust Hagin, and Hans Drewitz, both of Munich, Fed. Rep. of Germany, assignors to MAN Nutzfahrzeuge GmbH, Munich, Fed. Rep. of Germany

Continuation of Ser. No. 7/234,255, Aug. 19, 1988, abandoned. This application Feb. 7, 1990, Ser. No. 476,143

Claims priority, application Fed. Rep. of Germany, Aug. 27, 1987, 3728539; Jun. 16, 1988, 3820465

Int. Cl.[5] F02N *30/00*

U.S. Cl. 60—626 17 Claims



1. The combination comprising a hydromechanical power transmission connected to the output shaft of an engine of a motor vehicle for delivering power from the engine to drive the vehicle, and a starter system connected to said transmission to start the engine, said transmission including a mechanical drive part connected to the output shaft of the engine and a hydraulic part including two hydrostatic machines drivingly connected to one another and to said mechanical drive part, said starter system comprising a hydraulic starter accumulator connected to said two hydrostatic machines for being supplied with pressure fluid from said hydrostatic machines during drive of the engine, and for delivering the pressure fluid back to said hydraulic part of the transmission when the engine is halted to start the engine, said hydraulic starter accumulator having a filling capacity to provide a power output to start the engine at least once, means for preventing motion of the vehicle at least in the reverse direction during starting of the engine, controller means connected to said hydraulic starter accumulator, said engine and said hydromechanical power transmission for acting during halted and operational states of the vehicle for

(a) turning off the engine,

(b) starting the engine by supplying the pressure fluid in the hydraulic starter accumulator to said hydraulic part to drive the output shaft via said transmission, and

(c) supplying the starter accumulator with pressure fluid from the transmission during braking of the vehicle, and

auxiliary means connected to said starter accumulator for pressurizing the starter accumulator to enable starting the engine in the event that the accumulator is insufficiently pressurized by the transmission during braking of the vehicle.

4,959,963

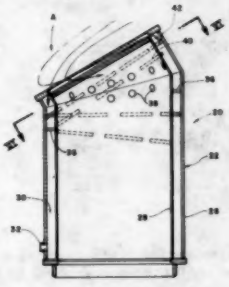
APPARATUS AND METHOD FOR IMPROVING FILM ENTRAPMENT OF A MOISTURE PRE-SEPARATOR FOR A STEAM TURBINE

Homer G. Hargrove, Maitland; Harry F. Martin, Altamonte Springs, both of Fla., and Donald K. Whirlow, Murrysville, Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 11, 1989, Ser. No. 336,027

Int. Cl.[5] F01K *21/00*

U.S. Cl. 60—646 16 Claims



1. A moisture pre-separator for a steam turbine having an exhaust portion and an exhaust nozzle, the pre-separator comprising:

an inner cylinder having inner and outer surfaces;

an outer cylinder having inner and outer surfaces and being concentric with the inner cylinder;

a bottom interconnecting lower ends of the inner and outer cylinders;

an annular collection chamber formed by the outer surface of the inner cylinder, the inner surface of the outer cylinder, and the bottom;

a drain disposed in the outer cylinder near the bottom for draining moisture collected in the annular collection chamber;

an upper cylinder extension connected to and extending the inner cylinder into the exhaust nozzle of the exhaust portion of the steam turbine, an entry gap being formed between the upper cylinder extension and the exhaust nozzle;

said inner and outer cylinders and bottom forming a pre-separator body which is connectable at one end to cross-under piping and to the nozzle at the other end so as to communicate steam through an interior of the inner cylinder; and

vent means for communicating steam from the collection chamber to the interior of the inner cylinder, thereby equalizing pressure around the circumference of the entry gap and increasing effectiveness of moisture entrapment.

4,959,964

CRYOSTAT WITH REFRIGERATOR CONTAINING SUPERCONDUCTIVE MAGNET

Norihide Saho; Takeo Nemoto; Hisanao Ogata, all of Ibaraki, and Mitsuru Saeki, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 12, 1989, Ser. No. 406,235

Claims priority, application Japan, Sep. 16, 1988, 63-230009; Feb. 20, 1989, 1-38223

Int. Cl.[5] F25B *19/02*

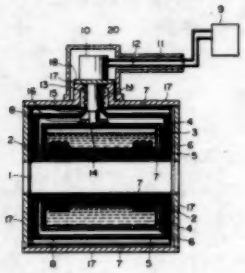
U.S. Cl. 62—51.1 15 Claims

1. A cryostat with refrigerator means including a low temperature end portion and containing superconductive magnet means, the cryostat comprising:

a material to be cooled, the low temperature end portion of

said refrigerator means being adapted to cool said material;

a heat-insulating tank means for receiving said material and said low temperature end portion of the refrigerator means, said heat insulating tank accommodating at least one heat shielding sleeve means surrounded by an insulating means for insulating an interior of said cryostat and



rigid coupling means for rigidly coupling said refrigerator means to a part of structural members disposed exteriorly of and covering said heat insulating tank means with a space between said heat-insulating tank means and said part of structural members.

4,959,965

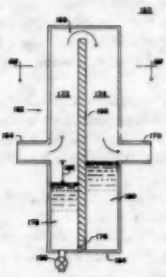
SYSTEM FOR MONITORING A LIQUID ENTRAINED IN A FLUID

Fredrick D. Browne, Somerville, and Jacob H. Martin, Wellesley, both of Mass., assignors to The Charles Stark Draper Laboratory, Inc., Cambridge, Mass.

Division of Ser. No. 151,071, Feb. 1, 1988, Pat. No. 4,872,316. This application Aug. 16, 1989, Ser. No. 394,549

Int. Cl.[5] F25B *49/00, 43/02*

U.S. Cl. 62—129 **11 Claims**



1. A monitoring system for detecting contamination of lubricants entrained in a refrigerant circulating through a closed refrigeration system, the monitoring system comprising;

a housing having an inlet for receiving circulating fluid having a liquid entrained therein, a reservoir for containing extracted liquid, and an outlet disposed in a predetermined relationship with said reservoir for venting the fluid from the housing;

means for altering the direction of fluid flow between said inlet and said outlet to cause the fluid to lose pressure to extract liquid from the fluid;

barrier means for separating said reservoir into an intake portion communicating with said inlet and a liquid return portion communicating with said outlet;

means for passing extracted liquid from said intake portion to said return portion to cause the extracted liquid to flow from said intake portion to said return portion for reentrainment in the circulating fluid;

probe means, disposed in said reservoir, for measuring an electrical parameter representative of the electrical resistance of the liquid to detect a change in resistance indicative of contamination of the liquid; and,

alarm means, responsive to the probe means for indicating when the probe means detects a change in resistivity of the extracted liquid.

4,959,966

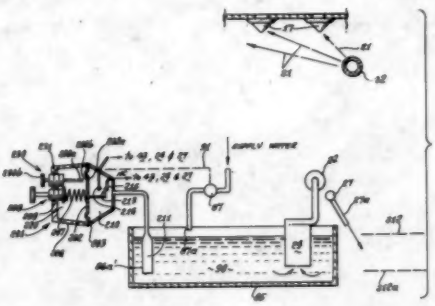
ICE FORMING APPARATUS

Berge A. Dimijian, 919 S. Highland Ave., Los Angeles, Calif. 90036, assignor to Berge A. Dimijian and Beverly Rodeo Development Corporation, both of Los Angeles, Calif., a part interest

Continuation-in-part of Ser. No. 311,765, Feb. 17, 1989, Pat. No. 4,899,548. This application Nov. 24, 1989, Ser. No. 438,031

Int. Cl.[5] F25C *1/12*

U.S. Cl. 62—138 **6 Claims**



5. In ice-making apparatus, the combination comprising:

(a) first means subject to cooling and heating, and having surface means on which ice is to be formed when said surface means is cooled, and from which ice pieces separate when said surface means is heated,

(b) second means to supply water to said surface means for formation of said ice pieces thereon, said second means including water reservoir means,

(c) and control means responsive to the water level in said reservoir means for effecting control of the sizes of the ice pieces formed on said surface means,

(d) and including a cluster of ducts extending upwardly above the water in the reservoir means to drain water falling from said surface means into the water in the reservoir, the tops of said ducts forming an incline onto which the ice pieces fall to be deflected away from the water reservoir means for collection.

4,959,967

AUTOMATIC DEVICE FOR PRODUCING ICE CUBES

Emanuele Lanzani, Milan, Italy, assignor to Frimont S.p.A., Milan, Italy

Filed May 23, 1989, Ser. No. 356,438

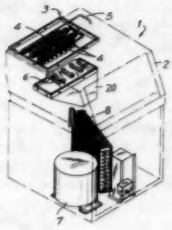
Claims priority, application Italy, Jul. 21, 1988, 21433 A/88

Int. Cl.[5] R25C *1/04*

U.S. Cl. 62—138 **6 Claims**

1. An automatic device for producing ice cubes, comprising a supporting frame for cube forming elements comprised by a plurality of mutually aligned cups supported by said frame and associated with an evaporator, said cups being arranged opposite to means for spraying water to be frozen, compressor and condenser means, and, detector means associated with said cube-forming elements and operative to reverse the refrigera-

tion cycle to separate said cubes from said cups, said detector means comprising means for checking the formation of at least one specimen cube, for varying the refrigeration time of the water employed to form said cubes and for varying the defrosting time of said cubes required to separate them from said cups, further including monitoring means having electronic analysis



elements defined by at least one electronic board, at least one first probe connected to said monitoring means for measuring one of the temperature of the environment and the temperature of the output of said condenser means, and at least one second probe connected to said monitoring means for measuring the temperature of water supplied to an input of the device.

4,959,968

METHOD FOR CONTROLLING THE DEFROSTING OF REFRIGERATOR-FREEZER UNITS OF VARYING DEGREES OF FROST ACCUMULATION

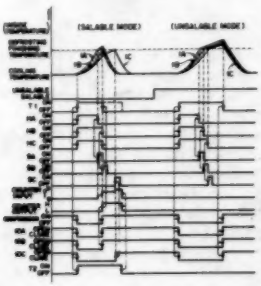
Toshiyuki Fukuda, Isesaki, Japan, assignor to Sanden Corporation, Gunma, Japan

Filed Mar. 17, 1989, Ser. No. 324,707

Claims priority, application Japan, Mar. 17, 1988, 63-64628; Mar. 17, 1988, 63-64629; Mar. 17, 1988, 63-64630; Mar. 17, 1988, 63-64632; Mar. 17, 1988, 63-64633; Mar. 17, 1988, 63-64634

Int. Cl.[5] F25D *21/08*

U.S. Cl. 62—155 **2 Claims**



1. A method for controlling the defrosting of a plurality of refrigerator-freezer units, the respective units having respective evaporators and respective defrosting heaters for defrosting frost accumulated on the evaporators, the respective evaporators being connected to a condenser and to a compressor via respective expansion valves and solenoid valves, comprising the steps of:

closing all of said solenoid valves, stopping the drive of said compressor and supplying electric current to all of said defrosting heaters after a defrosting timer having a cooling mode and a defrosting mode switches to its defrosting mode;

successively stopping the supply of electric current to a defrosting heater of said defrosting heaters after a corresponding sensor provided for each unit detects the defrosting of its corresponding evaporator;

forcedly resetting said defrosting timer to its cooling mode, stopping the supply of electric current to the rest of said defrosting heaters, beginning the drive of said compressor and opening the solenoid valves connected to defrosted evaporators after defrosting a preset number of evaporators among all of said evaporators; and

opening the rest of said solenoid valves at least after a preset time expires since the beginning of said defrosting mode.

4,959,969

REFRIGERATING CIRCUIT APPARATUS WITH MEMORY HAVING A PLURALITY OF CONTROLLING MODES

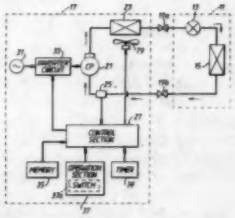
Hiroshi Okamoto, Fuji; Kimio Fushimi, Simizu; Satoru Mochizuki, and Yoshio Ootuka, both of Fuji, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed May 22, 1989, Ser. No. 354,813

Claims priority, application Japan, Sep. 30, 1988, 63-24672

Int. Cl.[5] G05D *23/32*

U.S. Cl. 62—157 **10 Claims**



1. A refrigerating circuit apparatus comprising:

variable capacity compressing means, having discharge and suction ports, for discharging refrigerant having a discharge side pressure and for drawing refrigerant having a suction side pressure lower than the discharge side pressure, the variable capacity compressing means including a compressing element and a variable rotation element for driving the compressing element;

means for supplying a variable output frequency to the variable rotation element for rotating the variable rotation element;

memory means for storing data defining at least two different predetermined control modes including a first mode having one rate of change of the output frequency of the supplying means and a second mode having a different rate of change of the output frequency;

means for selecting one of the first and second control modes from the memory means; and

control means for varying the output frequency of the supplying means in accordance with the selected mode for controlling the rotation speed of the variable rotation element.

4,959,970

AIR CONDITIONING APPARATUS

Gershon Meckler, 1176 Providence Cir., Apt. B, Reston, Va. 22090

PCT No. PCT/US88/01585, § 371 Date Jan. 12, 1989, § 102(e) Date Jan. 12, 1989, PCT Pub. No. WO88/08947, PCT Pub. Date Nov. 17, 1988

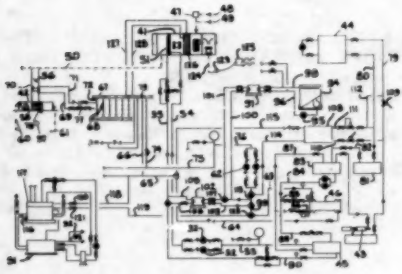
PCT Filed May 12, 1988, Ser. No. 327,980

Int. Cl.[5] F25D *17/08*

U.S. Cl. 62—176.1 **4 Claims**

1. Air conditioning apparatus comprising a plurality of air

outlets each of which is operable to deliver air circulated thereto to a space to be conditioned, means for dehumidifying air, means for circulating dehumidified air to said air outlets at a rate per unit of area in the spaces served by said air outlets which varies between a predetermined minimum rate greater than zero and a maximum rate, the maximum rate being substantially less than that which would be required to maintain the design temperature in each of the spaces at the maximum design cooling load with air supplied to the spaces at a dry bulb temperature of 55° F., means operable to control its moisture



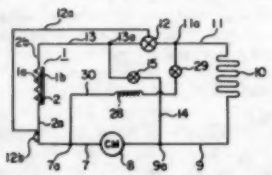
content and temperature so that the dehumidified air is incapable, at the rate at which it is required for humidity control, of maintaining the desired space temperature at the maximum design cooling load, a plurality of means positioned for heat transfer to or from spaces to be conditioned by the apparatus or to or from air delivered to spaces to be conditioned by the apparatus, and means operable to control the rate at which dehumidified air is delivered by said air outlets to the spaces they serve to one not less than the predetermined minimum rate and higher than that minimum when required to maintain a monitored condition of the space within control limits.

4,959,971

REFRIGERANT PIPING SYSTEM FOR REFRIGERATION EQUIPMENT

Katsunobu Minari, Toyoake, Japan, assignor to Hoshizaki Electric Co., Ltd., Toyoake, Japan

Filed Sep. 29, 1989, Ser. No. 414,685
Int. Cl.[5] F25C *5/10*
U.S. Cl. 62—197 **8 Claims**



1. A refrigerant piping system for a refrigeration machine repeating a heating operation and a cooling operation, comprising:

a closed coolant loop including a compressor having a suction port and a discharge port, a condenser having an inlet port and an outlet port, an expansion valve having an inlet port and an outlet port, and an evaporator having an inlet port and an outlet port, said compressor, said condenser, said expansion valve and said evaporator being sequentially connected in series to one another to form said closed coolant form;

a hot gas pipe connected in said closed coolant loop so as to be comunicated with said loop at locations between the discharge port of said compressor and the inlet port of said condenser on one hand and between the outlet port of said expansion valve and the inlet of said evaporator on the other hand, said hot gas pipe including a hot gas valve which is opened during the heating operation and closed during the cooling operation of said refrigeraton machine;

an injection pipe connected at one end between the outlet port of said condenser and the inlet port of said expansion valve and connected at the other end between the outlet port of said evaporator and the suction port of said compressor; and

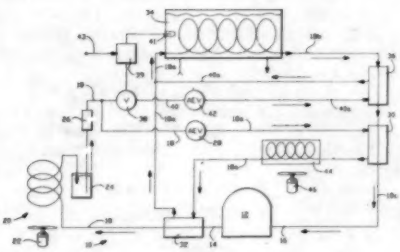
said injection pipe being provided with coolant inflow suppressing means adapted to be closed during the heating operation while being opened during the cooling operation, whereby liquid coolant resulting from condensation in said condenser is prevented from flowing into said compressor through said injection pipe during the heating operation.

4,959,972

WIDE RANGE REFRIGERATION SYSTEM WITH SUCTION GAS COOLING

Albert R. Lowes, Roseville, Calif., assignor to Mydax, Inc., Auburn, Calif.

Filed Sep. 5, 1989, Ser. No. 402,668
Int. Cl.[5] F25B *5/00*
U.S. Cl. 62—200 **3 Claims**



1. A refrigerant-compression temperature regulation system including compressor means for compressing said refrigerant in vapor and gaseous phase; condenser means downstream the compressor means for condensing the compressed refrigerant to liquid phase; first valve means downstream the condenser for creating a predetermined pressure drop; first evaporator means downstream the first valve means for transferring heat from a load to the refrigerant; suction gas return line means leading from the evaporator means to the compressor means for returning heated suction gas and vapor phase refrigerant to a suction inlet of the compressor means; and, first indirect heat exchanger means having a suction gas cooling path from the first valve means to upstream of the first evaporator means, the first indirect heat exchanger means for passively transferring heat from the gas and vapor phase refrigerant in the suction gas return line means to the vapor phase refrigerant entering the evaporator means and further comprising solenoid valve means between the condenser means and the first valve means, the solenoid valve means being opened in response to temperature of the load above a setpoint, and further comprising second valve means downstream of the condenser means and second indirect heat exchanger means having a suction gas cooling path from the second valve means to upstream of the first evaporator means, the second indirect heat exchanger means for passively transferring heat from the gas and vapor phase refrigerant in the suction gas return line means to the vapor phase refrigerant entering the evaporator means when

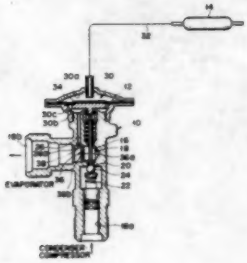
the setpoint is above the load temperature and the solenoid valve means is closed.

4,959,973

THERMOSTATIC EXPANSION VALVE

Hazime Tanaka, Yokohama, Japan, and Ernest W. Schumacher, Ovilla, Tex., assignors to Fuji Koki Manufacturing Co., Ltd., Japan

Filed May 22, 1989, Ser. No. 355,160
Claims priority, application Japan, May 23, 1988, 63-125499
Int. Cl.[5] F25B *41/04*
U.S. Cl. 62—225 **6 Claims**



1. A thermostatic expansion valve which is used in a refrigeration apparatus and is provided with a diaphragm, serving to receive at one side surface thereof the pressure of operating fluid fed from a thermal bulb located at the outlet of an evaporator in the refrigeration apparatus and connected at the other side surface thereof to a valve mechanism, and which is intended to control the valve mechanism responsive to a change in a difference between the pressure applied to the one and the other side surfaces of the diaphragm by the displacement of the diaphragm owing to the pressure difference and to control the flow rate of refrigerant flowing into the evaporator, said thermostatic expansion valve comprising:

a valve housing which serves to support the diaphragm and has a refrigerant passage connected at its one end to the inlet of the evaporator and supplied at its the other end with high pressurized refrigerant flowing from a compressor in the refrigeration apparatus, a valve seat formed in the refrigerant passage to control the flow rate of the refrigerant flowing from the compressor, in co-operation with a valve body of the valve mechanism, and an equalizing signal passage for introducing the pressure-reduced refrigerant, which has been reduced in pressure by the cooperation of the valve body of the valve mechanism with the valve seat in the refrigerant passage, from a pressure-reduced refrigerant outlet space located at the downstream side of the valve seat in the refrigerant passage to the other side surface of the diaphragm; and

means, located in the pressure-reduced refrigerant outlet space, for accelerating the velocity of the pressure-reduced refrigerant;

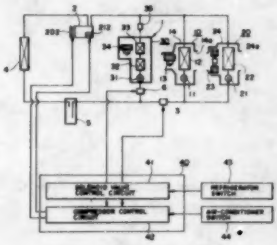
wherein said accelerating means is constructed by setting a sectional area of the pressure-reduced refrigerant outlet space in a direction substantially perpendicular to the moving direction of the pressure-reduced refrigerant larger than the sectional area of a refrigerant passing hole in the valve seat between the opening of the equalizing signal passage on the side of the pressure-reduced outlet space and the valve seat, but smaller than the sectional area of the pressure-reduced refrigerant outlet space at a position remoter from the valve seat than the opening of the equalizing signal passage on the side of the pressure-reduced refrigerant outlet space.

4,959,974

AIR-CONDITIONING CONTROL SYSTEM WITH FREEZING CHAMBER-EQUIPPED REFRIGERATOR FOR VEHICLES

Hideshi Kusakabe, Konan, Japan, assignor to Diesel Kiki Co., Ltd., Tokyo, Japan

Filed Jul. 17, 1989, Ser. No. 380,879
Claims priority, application Japan, Jul. 28, 1988, 63-100930
Int. Cl.[5] F25B *5/02*
U.S. Cl. 62—228.5 **8 Claims**



1. An air conditioning control system for use in an automotive vehicle including a compartment, and a refrigerator having a freezing chamber, which comprises:

a variable capacity compressor having the capacity thereof being variable by an external control signal;

at least one first cooling unit for cooling said compartment;

a second cooling unit for cooking said refrigerator;

a first valve arranged between said compressor and an inlet side of said at least one first cooling unit for connecting them to cause same to form a cooling circuit to thereby enable refrigerant to be supplied to said at least one first cooling unit when said first valve is open;

a second valve arranged between said compressor and an inlet side of said second cooling unit for connecting them to cause same to form a refrigerating circuit to thereby enable refrigerant to be supplied to said second cooling unit when said second valve is open;

first control means for alternately opening and closing said first and second valve at predetermined constant time intervals independents of temperatures of said at least one first cooling unit and of said second cooling unit; and

second control means responsive to opening and closing of said first and second valves for supplying a predetermined control signal to said compressor, when said second valve is open, for causing increasing of the capacity of said compressor to such a degree as to enable making ice in said freezing chamber of said refrigerator.

4,959,975

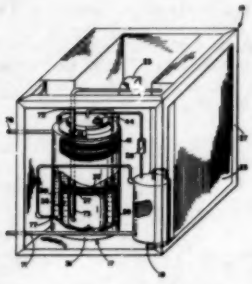
HEAT PUMP SYSTEM

Kenneth J. Harris, Chardon, Ohio, assignor to Conserve, Inc., Erie, Pa.

Filed May 14, 1987, Ser. No. 50,704
Int. Cl.[5] F25B *27/00*
U.S. Cl. 62—238.6 **4 Claims**

1. A heat pump installation comprising refrigerant, a condenser, a motor-compresaor, an evaporator, and a subcooler to subcool the refrigerant flowing from said condenser before it enters said evaporator so as to increase the efficiency of the installation and wherein said subcooler includes a housing containing a circulating liquid medium and a subcooling coil through which said refrigerant flows immersed in said circulating liquid, said subcooling coil including an inlet tube, a first portion, a second portion, and an outlet tube, said first portion comprising a pair of tubes extending essentially parallel to one

another and connected at one common end to said inlet tube and connected at the other common end to said second por-



tion, said second portion including multiple fins to maximize the transfer of heat from said refrigerant flowing therein.

4,959,976

REFRIGERATOR, DRY AIR GENERATING DEVICE FOR THE SAME, AND METHOD FOR OPERATING THE DEVICE

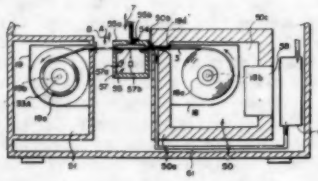
Shinichi Matsuda, Kanagawa; Yoshio Saito, Saitama, and Hideo Ishizaka, Kanagawa, all of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Dec. 4, 1989, Ser. No. 444,906

Claims priority, application Japan, Dec. 7, 1988, 63-309385; Dec. 7, 1988, 63-309388

Int. Cl.[5] **F25D** *23/12;* **G01N** *31/00*

U.S. Cl. 62—271 **7 Claims**



1. A refrigerator comprising a cassette accommodating section which is enclosed by a wall, kept at a low temperature, and capable of accommodating a film feed cassette such that it can be released therefrom, said film feed cassette housing therein a long test film containing a reagent which will react with a liquid sample and give rise to a change in optical density and having a film outlet through which the long test film is fed out, the refrigerator being provided with a film outlet which is formed at the position in the wall corresponding to the position of the film outlet of the film feed cassette when it is located in the cassette accommodating section, said long test film being pulled out through said film outlet of said film feed cassette,

wherein the improvement comprises the provision of an air stream jetting means for generating a dry air stream between said film outlet of said film feed cassette, which film feed cassette is located in said cassette accommodating section, and said film outlet of said refrigerator so that the dry air stream is jetted to the surface of the portion of said long test film which is positioned on the side outward from and in the vicinity of said film outlet of said film feed cassette.

4,959,977

MACHINE FOR AND METHOD OF PERFORMING A ROUGHING OPERATION PROGRESSIVELY ALONG MARGINAL PORTIONS OF A SHOE BOTTOM

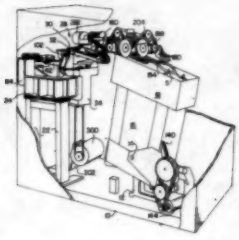
John Davies, Syston, and Herbert W. Boot, Thurmaston, both of England, assignors to British United Shoe Machinery Ltd., Leicester, England

Continuation of Ser. No. 478,260, Mar. 24, 1983, abandoned. This application Jan. 27, 1989, Ser. No. 303,045

Claims priority, application United Kingdom, Apr. 8, 1982, 8210488

Int. Cl.[5] **C14B** *1/44, 17/04*

U.S. Cl. 69—6.5 **12 Claims**



1. A machine for performing a roughing operation progressively along marginal portions of a shoe bottom, comprising:

a shoe support;

means for supporting at least one roughing tool; and

means, operable under the control of control means, for effecting relative movement between the shoe support and tool supporting means both lengthwise of the bottom of a shoe supported by the shoe support and widthwise thereof, such relative lengthwise movement being effected first in one direction and then in an opposite direction, whereby a roughing operation can be performed progressively first along the marginal portion of one side of a shoe bottom supported by the shoe support and then along the marginal portion of the opposite side of such shoe bottom, characterized in that signalling means is provided by which a signal can be supplied to the control means indicating whether the shoe next to be operated upon is a left or a right, and in response to a signal from which the control means is effective so to cause relative movement to be effected as aforesaid between the shoe support and tool supporting means that a roughing operation takes place along the inside waist region of the shoe bottom in the same direction regardless of whether the shoe is a left or a right.

4,959,978

PROGRAMMABLE PUSHBUTTON COMBINATION LOCK

Mitchell G. Cappell, 64 Samuel Oster Avenue, Thornhill, Ontario, Canada (L4J 7C8), and Malcolm Stephens, 188 Lester Street, Apt. 26B, Waterloo, Ontario, Canada (N2L 3W4)

Filed Oct. 20, 1989, Ser. No. 424,722

Int. Cl.[5] **E05B** *37/16*

U.S. Cl. 70—25 **2 Claims**

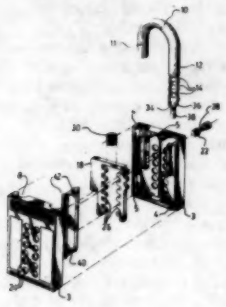
1. A pushbutton combination lock comprising:

a case;

locking means including a locking arm within and projecting from said case, said locking means and locking arm being moveable in linear fashion between a locked and an unlocked position;

a plurality of buttons projecting from the case normal to the direction of movement of said locking means, owner-reversible end-over-end between two orientations and moveable through holes in said case between first and second

positions such that in one said orientation, movement of said locking means is barred in said first position and permitted in said second position, and in the other said orientation movement of said locking means is permitted



in said first position and barred in said second position, the orientation of any button not being visually ascertainable from outside the case, whereby the lock owner can program the combination of the lock by selecting the orientation of the respective buttons.

4,959,979

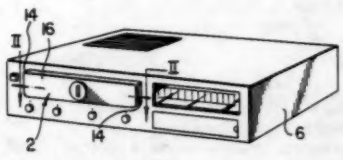
SECURITY DEVICE FOR A FRONT-LOADING VCR

Catherine M. Filipow, 109 - 2166 Loyola Avenue, Gloucester, Ontario, K1J 8H5, and Arthur R. Whited, 308 - 3540 Peter Street, Windsor, Ontario, N9C 4C1, Canada

Filed Jul. 28, 1988, Ser. No. 225,257

Int. Cl.[5] E05B *73/00*

U.S. Cl. 70—58 **6 Claims**



1. A security device for a front-loading VCR having a cassette-receiving opening defined by walls of the VCR casing, to prevent its being used and to obstruct access to its interior mechanisms, the device comprising a body mountable on the VCR in position to cover the cassette-receiving opening, so as to obstruct access to the interior of the VCR through that opening, clamp means on the body, movable to clamping position interacting with the VCR to releasably secure the body in position, and lock means associated with the clamp means to lock the clamp means in clamping position, wherein the clamp means comprises a pair of extension means operatively associated with the lock means and movably secured to the body to extend outwardly into clamping position engaging the VCR walls defining the VCR opening, when the lock means is locked, and to be in retracted position clear of those walls when the lock means is in unlocked position so as to permit unobstructed removal of the body from its position in the cassette-receiving opening of the VCR, and the lock rotatably mounted in the body, a key slot means for the cylinder being provided on the front of the body, and the clamp means comprises a cam with a cam surface, secured to the lock cylinder to rotate therewith, and rod means slidably extending between the cam surface and the sides of the body, the cam surface and the rod means being positioned and operating so that when the lock means is in locked position the cam is in operative position with portions of the rod means extending outwardly from the body to lodge behind the walls defining the cassette-receiving opening of the VCR, and when the lock means is in unlocked position then the cam is in inoperative position so that the rod means are retracted clear of those walls, and further comprising cam follower means between the rod means and the cam surface to permit the cam to turn fully to operative position even if one of the rod means becomes lodged before the cam has reached that operative position; wherein the rod means comprises a pair of rods, one on each side of the cam, mounted on the body to slide outwardly in opposite directions as the cam is moved to operative position, wherein spring means are associated with the body and the rods to urge the rods inwardly, to inoperative position as the cam is moved from operative to inoperative, and wherein the cam follower comprises a stirrup means spring mounted to the inner end of each of the rods, each stirrup means being normally spaced a predetermined distance from the inner end of each rod and having a portion slidably engaging the cam surface.

4,959,980

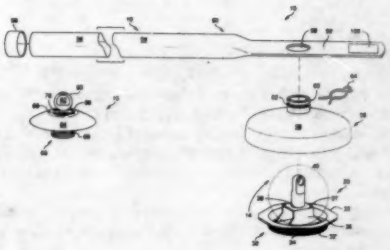
STORAGE DRUM SECURITY DEVICE

Mark S. Phillips, 510 Budd Ave., Campbell, Calif. 95008

Filed Dec. 13, 1989, Ser. No. 450,169

Int. Cl.[5] B65D *55/14*

U.S. Cl. 70—158 **16 Claims**



1. A security device adapted for use with multiple aperture surfaces including at least a first aperture and a second aperture arrayed so as to be generally coplanar, comprising:

a first bung member adapted to releasably mate with the first aperture, the first bung member including a first projection which extends therefrom exteriorally from the surface;

a second bung member adapted to releasably mate with the second aperture, the second bung member including a second projection which extends therefrom exteriorally from the surface, said second projection including a narrow intermediate portion and a broad terminal portion;

an isolator member for extending over the first bung member and interrelating to the surface in such a manner that the preponderance of the first bung member is inaccessible from the exterior of the isolator member, said first projection extending through the isolator member; and

an elongated securing member for extending between the first bung member and the second bung member, the securing member engaging both said first projection and said second projection, with the engagement with one of said projections being inaccessible from the exterior of the engagement member and not subject to disengagement as long as the engagement is maintained with the other of said projections, the engagement with the other of said projections being adapted to securing with a locking means for attaching the securing member in place such that neither aperture is accessible while such attachment is maintained; and wherein

the elongated securing member includes an aperture extend-

ing therethrough for receiving said first projection and a receiving structure axially separated from said aperture, said receiving structure being adapted to receive a terminal portion of said second bung member into the interior of the securing member, said receiving structure including a receiving aperture having an opening adapted to permit passage therethrough of said terminal portion and a sliding channel extending outwardly from said receiving aperture, said sliding channel having a width greater than that of said intermediate portion but less than that of said terminal portion so that when the securing member is slid such that said intermediate portion is within said sliding channel the securing member may not be detached from the second bung member.

4,959,981

PORTABLE VEHICLE SECURITY LOCK WITH ILLUMINATION MEANS

Roger Davidson, 10320 Rockville Pike, Rockville, Md. 20852

Filed Jan. 13, 1989, Ser. No. 296,702

Int. Cl.[5] E05B *41/00, 65/12*

U.S. Cl. 70—238 **7 Claims**

1. A portable steering wheel locking mechanism having a profile for use with a motor vehicle having a steering wheel and a brake pedal, said locking mechanism comprising:

an elongated member having opposed first and second ends, brake pedal engaging means disposed on the first end of said elongated member for coupling the brake pedal of the vehicle,

steering wheel engaging means disposed on the second end of said elongated member for coupling the steering wheel of the vehicle,

access locking means having secured and unsecured positions and also being disposed on the second end of the elongated member for securing the locking mechanism in place, and illumination means for signalling presence of said steering wheel locking mechanism with said motor vehicle, said illumination means including a source of power, luminous means disposed on said locking mechanism and powered by said source of power for visually indicated the profile of said locking mechanism, and condition responsive means for sensing engagement of said locking mechanism and for activating said source of power to energize said luminous means,

said luminous means further comprising a plurality of light emitting diode elements disposed on said locking mechanism and periodic lighting means for periodically activating said diode elements thereby to conserve power during operation.

4,959,982

INTERLOCK DEVICE BETWEEN AN IGNITION LOCK AND A MANUAL SELECTOR LEVER FOR AN AUTOMATIC GEAR-CHANGE TRANSMISSION

Lothar Maux, Esslingen, and Harald Gellner, Marbach, both of Fed. Rep. of Germany, assignors to Daimler-Benz AG, Stuttgart, Fed. Rep. of Germany

Filed Oct. 31, 1989, Ser. No. 430,639

Claims priority, application Fed. Rep. of Germany, Dec. 16, 1988, 3842332

Int. Cl.[5] E05B *25/12*

U.S. Cl. 70—248 **20 Claims**

1. An interlock device between an ignition key lock and a manual selector lever of an automatic gear change transmission; comprising;

a first detent cam on a camshaft part which is rotatable by an ignition key about an axis and counter to a first resilient means;

the camshaft part is mounted in alignment with and rotatable relative to an axis of rotation of the ignition key lock;

the detent cam interacts with a first latch element which is displacably arranged on a housing part, fixed in terms of movement relative to an ignition key lock housing;

the first latch element is connected kinematically to a rod end of a mechanical adjusting linkage;

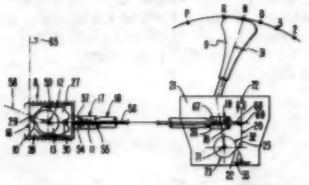
another end of the mechanical linkage is connected kinematically to a further latch element pivotably mounted on a housing part fixed to the vehicle, in the vicinity of the manual selector lever;

the further latch element interacts with a second detent cam;

the second detent cam is moveable by the manual selector lever through a counterdetent means;

wherein when the manual selector lever is actuable into a parking position, the ignition key lock is moved into a set rotary angle position wherein an ignition key can be inserted and withdrawn from the ignition key lock and wherein a mutual relationship of the two detent cams and latch elements is such that only in the parking position of the manual selector lever can the ignition lock be brought into said one set rotary angle position and wherein the manual selector lever is necessarily locked in its parking position;

wherein the second detent cam of the manual selector lever is uncoupled from the counterdetent means of the further



pivotable latch element when the manual selector lever is not in the parking position;

wherein second resilient means, supported relative to the housing part, act with an uncoupling effect to disengage the second pivotable latch element from the second detent cam;

wherein the camshaft part has its axis of rotation aligned with an orifice of a frame-shaped slide of the first displacable latch element;

wherein an additional control cam on the camshaft part can be brought into engagement with a counter control cam on the frame-shaped slide by operation of the first detent cam contacting a counterdetent cam on the frame-shape slide;

wherein the counterdetent cam and counter control cam are arranged radially relative to the axis of rotation of the camshaft part and at points on the slide that are located diammetrically opposite one another in relation to the camshaft part;

wherein the counterdetent cam is located at a angle of rotation in front of a rotary angle position corresponding to the one set rotary angle position of rest;

wherein the counter detent cam can be brought out of engagement with the detent cam of the camshaft part by the resilient means counteracting the actuation by the ignition key;

wherein the resilient means, counteracting the actuation of the ignition key, is designed with a higher spring force than the second resilient means acting on the second pivotable latch element to disengage the second latch

element from the second detent cam of the manual selector lever; and

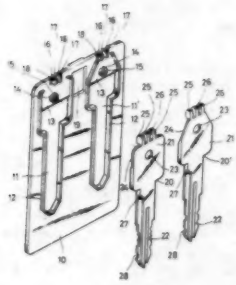
wherein during actuation of the ignition key of the ignition key lock into a rotary angle position corresponding to a driving position of the ignition key lock, the additional control cam of the camshaft part comes into engagement with the counter control cam on the frame-shape slide such that the counterdetent cam of the slide is located in the path of movement of the first detent cam of the camshaft part and the second pivotable latch element is uncoupled from the second detent cam of the manual selector lever.

4,959,983

SPARE KEYS AND CARD FOR RETAINING THEM

Ming-Huei Hsu, 3F, No. 51, Alley 25, Lane 639 Ming Sheng East Road, Taipei, Taiwan

Filed Jan. 8, 1990, Ser. No. 461,619
Int. Cl.[5] A47G *29/10*
U.S. Cl. 70—456 R **5 Claims**



1. A set of spare keys and retaining card comprising

a retaining card having a plurality of key profile hollows formed within it, and

a plurality of spare keys which mainly consists of a key head and a key way portion;

said key profile hollows of said retaining card being provided with a flange around their periphery,

said key profile hollows having a retaining plate formed on its upper portion therein a substantially round projected button is formed;

said retaining card having two projected blocks disposed in a dent formed near the center of the upper edge of said retaining card to divide said dent into three spaces;

said two projected blocks having a sunk spot on each of their outside surface in opposite direction;

said spare keys having similar profile as the key profile hollows seperately, and having a sunken flat surface formed at the back of the key head of each said spare keys wherein a round hole is formed;

said spare keys having three lugs on their top edge while the two outside lugs have a buldge on their inner surface;

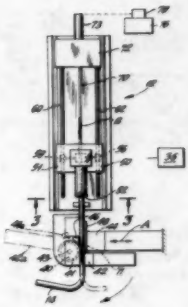
said spare keys being adequately insetable into said key profile hollows seperately and said retaining plate being adequately matched with said sunken flat surface on the back of said key head; said round hole within the sunken surface being engageable with said projected button, and said three lugs on said spare key being able to inset into said three spaces formed by said two projected blocks disposed on said retaining card with said two buldges engaged with said two sunk spots.

4,959,984

PRECISION BENDING APPARATUS

Gerald R. Trudell, Pinconning, and Terrance C. Marlinga, Kawkawlin, both of Mich., assignors to AP Parts Manufacturing Company, Toledo, Ohio

Filed Aug. 17, 1989, Ser. No. 395,043
Int. Cl.[5] B21D *7/04*
U.S. Cl. 72—20 **11 Claims**



9. A tube bending apparatus for placing a plurality of bends in a tube, said apparatus comprising:

collet means for securely gripping one end of the tube and for axially and rotationally positioning the tube for selective placement of the bends therein, said collet means further being operative to exert an axial force on the gripped end of the tube while the bending apparatus is placing at least a portion of each said bend therein;

non-rotatable clamping means for securely gripping the tube at a location adjacent the selected position for said bend, said non-rotatable clamping means further being operative to exert axial forces on said tube during the placement of at least a portion of each bend in the tube by the bending apparatus;

rotatable clamping means for clamping the tube at the selected positions thereon for said bends, and for rotating with the tube clamped therein to place the selected bends in the tube;

pressure sensing means for sensing the resistance to the axial forces exerted by at least the collet means on the tube;

control means operatively connected to the pressure sensing means and to the rotatable clamping means, said control means being operative to alter the operation of the rotatable clamping means in response to the pressure sensed by said pressure sensing means and to decrease the pressure exerted by the collet means and by the non-rotatable clamping means after approximately 5° of rotational movement by the rotatable clamping means.

4,959,985

METHOD OF MANUFACTURING METALLIC TUBE WITH SPIRAL FIN

Kouichi Kuroda; Chihiro Hayashi, and Kazuyuki Nakasuji, all of Amagasaki, Japan, assignors to Sumitomo Metal Industries Ltd., Osaka, Japan

Continuation of Ser. No. 201,466, Jun. 2, 1988, Pat. No. 4,901,553. This application Sep. 8, 1989, Ser. No. 404,641
Claims priority, application Japan, Jun. 3, 1987, 62-139380; Oct. 20, 1987, 62-266029
Int. Cl.[5] B21H *3/12*
U.S. Cl. 72—97 **20 Claims**

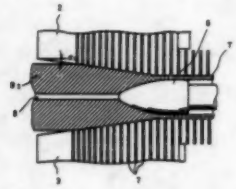
1. A method of manufacturing a finned steel tube comprising:

supplying a steel starting hollow bar provided with a hole having a small diameter formed in a central portion thereof to an inclined rolling mill having a plurality of

rotating rolls disposed around a pass line and provided with a plurality of annular grooves formed in a circumferential direction of an outer circumferential surface thereof;

rolling said steel starting hollow bar by said rolls; and

working said steel starting hollow bar by inserting an expansion tool into said hollow bar to expand the diameter of



said hole and form an expanded hollow bar and at the same time introducing material of said steel starting hollow bar into said grooves to form at least one fin on the outer circumferential surface of the expanded hollow bar, the inside diameter of said steel starting hollow bar being ½ or less times as large as the largest diameter of said expansion tool.

4,959,986

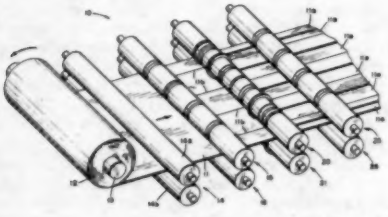
APPARATUS FOR CUTTING A WIDE SHEET OF METAL MATERIAL INTO A PLURALITY OF NARROW STRIPS

Daniel Kranis, Sr., Wernersville, Pa., assignor to Dana Corporation, Toledo, Ohio

Filed Sep. 1, 1989, Ser. No. 401,988

Int. Cl.[5] B21D *1/02*

U.S. Cl. 72—129 **12 Claims**



1. An apparatus for cutting a relatively narrow strip from a relatively wide sheet of material having internal stresses comprising:

means for moving the sheet of material along a path;

slitting disc means disposed in said path for cutting the strip from the sheet of material and;

furrowing disc means disposed in said path for forming a relatively shallow furrow in the strip to relieve the internal stresses present therein such that the strip is substantially flat after being cut from the sheet.

4,959,987

ROLLING MILL STAND WITH MANIPULATOR

Wolfgang Hackenberg, Hilchenbach, Fed. Rep. of Germany, assignor to SMS Schloemann-Siemag Aktiengesellschaft, Dusseldorf, Fed. Rep. of Germany

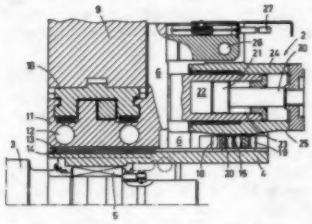
Filed Jan. 30, 1989, Ser. No. 304,366

Claims priority, application Fed. Rep. of Germany, Jan. 30, 1988, 3802813

Int. Cl.[5] B21B *31/18*

U.S. Cl. 72—247 **4 Claims**

1. In a rolling mill stand with at least one manipulator for axially moving rolls of the rolling mill stand, the rolling mill stand including housings and chocks guided in the housings so as to be vertically slidable in the direction of the rolling force, the rolls of the rolling mill stand being supported and secured in the chocks, the rolls having axes, the chocks including pushing blocks for effecting horizontal guidance in the direction of the roll axes, the rolling mill stand having an operator side, the manipulators acting on the pushing blocks from the operator side, the improvement comprising the manipulator



being connected to the pushing block through a non-slip gear arrangement for transmitting an adjusting distance of the manipulator, wherein each pushing block and each chock have each at least one rack, wherein the rack of the pushing block and the rack of the chock are arranged opposite each other, at least one pinion having an axle being arranged between and in engagement with the racks, the axle of the pinion being connected to the manipulator.

4,959,988

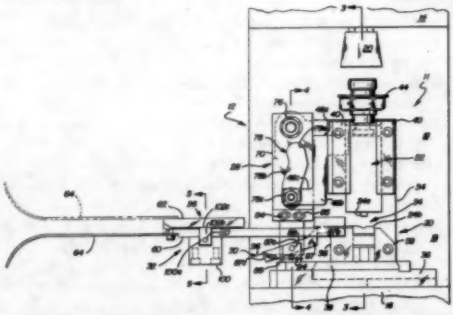
APPLICATOR DIE

Donald A. Dassance, Cadillac, and Richard E. Feldborg, Grosse Pointe, both of Mich., assignors to ACU-Crimp, Inc., Mesick, Mich.

Filed Oct. 10, 1989, Ser. No. 418,501

Int. Cl.[5] H01R *43/04*

U.S. Cl. 72—421 **18 Claims**



1. An applicator die for use with a crimping machine of the type in which a supply of terminals is fed to the machine in the form of a terminal strip comprising a plurality of serially arranged, interconnected terminals, individual leads are fed to the machine, and the machine functions to crimpingly apply a terminal to an end of each lead and sever the terminal from the terminal strip in a manner to produce a series of leads each having a terminal crimpingly secured to an end thereof, said applicator die including:

(A) a housing defining a generally vertical slideway;

(B) means defining a generally horizontal feed path for the terminal strip;

(C) a slide mounted above said feed path for reciprocal generally vertical sliding movement in said slideway;

(D) die means operative in response to sliding movement of

said slide in said slideway to crimp a terminal to a lead and sever the terminal from the terminal strip;

(E) a support structure supported on said housing at a location above said path and extending downwardly past said path to a location beneath said path;

(F) a feed member mounted on said support structure underneath said path and movable when actuated to incrementally advance the terminal strip along said feed path toward said die means; and

(G) actuator means operative in response to sliding movement of said slide in said slideway to actuate said feed member.

4,959,989

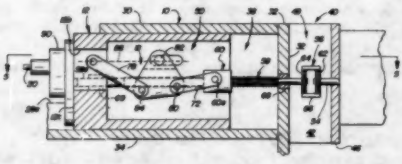
FORCE MULTIPLYING PRESS

Robert E. Obrecht, Bloomfield Hills, and Edward J. Waltonen, Southfield, both of Mich., assignors to REO Hydraulic Pierce & Form, Detroit, Mich.

Continuation-in-part of Ser. No. 204,249, Jun. 9, 1988, Pat. No. 4,916,932. This application Jan. 13, 1989, Ser. No. 296,607

Int. Cl.[5] B21J *9/18*

U.S. Cl. 72—450 **35 Claims**



1. A press for performing a work operation on a workpiece, said press comprising:

a frame defining a bore having an axis;

a ram slidably mounted in said bore for movement along said axis and having a first end positioned within said bore and a free end;

a first fabricating tool mounted on said ram free end;

an electric motor including an output shaft rotated in response to actuation of said motor;

a drive member movable along an axis parallel to said bore axis through power and return strokes in response to rotation of said output shaft; and

a force multiplying mechanism interconnecting said drive member and said ram and operative in response to power stroking movement of said drive member to move said fabricating tool to a preparatory position and thereafter multiply the force applied to said tool to facilitate the performance of the work operation.

4,959,990

COMBINED MASS FLOW/PITOT TUBE METER

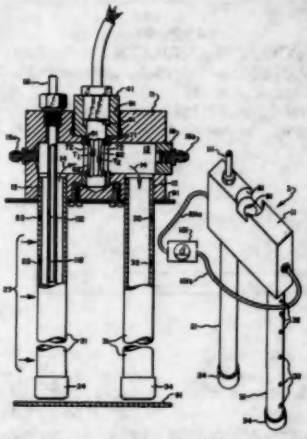
Robert H. Morris, P.O. Box 563, Mount Freedom, N.J. 07970

Filed Apr. 10, 1989, Ser. No. 335,225

Int. Cl.[5] G01F *1/68, 5/00*

U.S. Cl. 73—202 **9 Claims**

1. In a mass flow meter having a bypass channel, the improvement comprising the combination of a rotary valve mounted for rotation about an axis extending transverse to said channel and having an elongated slot extending therethrough, said valve permitting fluid to flow through said channel when said valve is rotated to a first position with said slot within said channel and blocking the flow of fluid through said channel when said valve is rotated to a second position with said slot located outside said channel, and mass flow sensing means



positioned in said slot to monitor fluid flow through said channel when said valve is in said first position.

4,959,991

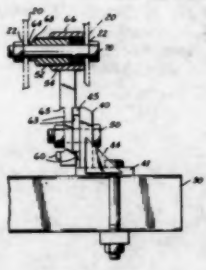
VEHICLE CHASSIS SUPPORT

Thorbjorn B. Andersson, Esketeuna, Sweden, assignor to Car-O-Liner Company, Wixom, Mich.

Filed Dec. 29, 1989, Ser. No. 459,138

Int. Cl.[5] B21D *1/12*

U.S. Cl. 72—457 **6 Claims**



1. A support for mounting on an alignment bench a vehicle chassis having an attachment bracket with a pair of spaced apart walls with generally coaxial holes therethrough for receiving the shank of a fastener for a component part of the vehicle, said support comprising: an arm constructed and arranged to be releasably carried by the alignment bench, a bushing and a sleeve complementarily threaded and telescoped together so that the axial length between their distal ends can be increased and decreased by relative rotation of said bushing and sleeve, one of said bushing and sleeve being secured to said arm and the other being rotatable relative to said arm, a hole extending generally axially through said bushing and sleeve, said arm, bushing and sleeve being constructed and arranged so that the bushing and sleeve can be inserted between the walls of a vehicle attachment bracket and the other of said bushing and sleeve rotated to extend the axial length of the bushing and sleeve assembly so that its distal ends are disposed closely adjacent the inner faces of the walls of the bracket with said hole through said bushing and sleeve being generally

aligned with the holes through the walls of the bracket for receiving the shank of a fastener therethrough.

4,959,992

PIEZO-ELECTRIC TRANSDUCER TEST APPARATUS

Robert Gentles, Linlithgow, Scotland, assignor to The Marconi Company Limited, England

Filed Apr. 17, 1989, Ser. No. 338,952

Claims priority, application United Kingdom, Apr. 25, 1988, 8809687

Int. Cl.[5] H01L *41/42*

U.S. Cl. 73—10 V 6 Claims

1. An acoustic loading rod for use in testing transducers which normally operate in a liquid medium, the loading rod comprising: an elongated body having opposite ends and a rod material capable of simulating the normal acoustic impedance presented to a transducer to be tested by the medium in which the transducer is to operate, the body having an internal tapered bore containing a core of material having a close match of acoustic impedance with the rod material but a higher acoustic los factor than the rod material, said core material being a metal loaded, partially polymerized epoxy, and a piezoelectric transducer means mounted between the ends of the body.

4,959,993

ACCELERATION DETECTOR

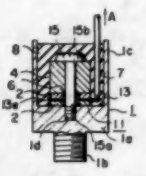
Satoai Komurasaki, Himeji, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 9, 1989, Ser. No. 364,043

Claims priority, application Japan, Jun. 10, 1988, 63-76289[U]; Jun. 22, 1988, 63-152422

Int. Cl.[5] G01H *11/08*

U.S. Cl. 73—35 4 Claims



1. An acceleration detector comprising:

ring-shaped piezoelectric elements;

a terminal having a ring-shaped eye portion disposed between said piezoelectric elements for taking out an output from said piezoelectric elements;

a weight for applying a stress to said piezoelectric elements in response to an acceleration applied to the detector;

a base capable of being secured to an object of which acceleration is to be detected;

a mounting screw extending through said piezoelectric elements, said terminal and said weight for mounting them to said base; and

an electrically insulating tube placed over said mounting screw for insulating said mounting screw from said piezoelectric elements and said terminal;

said terminal having a bent tab at the outer circumference of said ring-shaped eye portion for engaging the outer circumferential surface of at least one of said piezoelectric elements.

4,959,994

METHOD OF AND AN ARRANGEMENT FOR MEASURING THE PROPERTIES OF A STIFF MASS TO BE COMPACTED

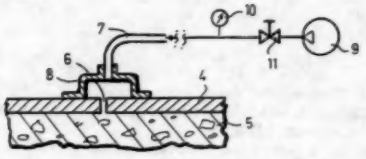
Ilmari Paakkinen, PPA 1, Moinsalmi, SF-57230 Savonlinna, Finland

Filed Oct. 6, 1989, Ser. No. 417,901

Claims priority, application Finland, Oct. 11, 1988, 884666

Int. Cl.[5] G01N *15/08, 33/38*

U.S. Cl. 73—38 19 Claims



1. A method of measuring the properties, particularly the degree of compaction of a stiff mass to be compacted, such as fresh concrete to be cast and similar soil mass, said method comprising blowing gaseous pressure fluid through the mass during the compaction of the mass, simultaneously observing increase in the pressure of the gaseous pressure fluid in the surface portions of the mass due to increasing flow resistance.

4,959,995

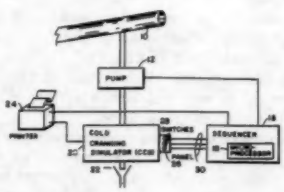
AUTOMATED COLD CRANK SIMULATOR

Asoke K. Deysarkar, Katy, and Ralph J. McCloskey, Conroe, both of Tex., assignors to Pennzoil Products Company, Houston, Tex.

Continuation of Ser. No. 8,663, Jan. 30, 1987, abandoned. This application Jan. 17, 1989, Ser. No. 298,257

Int. Cl.[5] G01N *11/00*

U.S. Cl. 73—54 12 Claims



1. In a cold cranking simulator for multi-viscosity motor oils, including therein a controllable cooling and heating apparatus for controlling temperature of a sample delivered thereto and a motor, the improvement comprising

means for integrating said cold cranking simulator into a plant control system to provide a substantially continuous and autonomous monitoring of viscosity of motor oil flowing in a conduit, thereby eliminating a requirement for manual intervention in the monitoring process, including:

single sample providing means including means for retrieving a discrete sample from the conduit and means for introduction of the sample into a measurement chamber of said cold cranking simulator

sequencing means for controlling said single sample providing means and said cold cranking simulator to provide substantially continuous and unattended withdrawal and delivery of samples from the conduit and to said cold cranking simulator, respectively; and

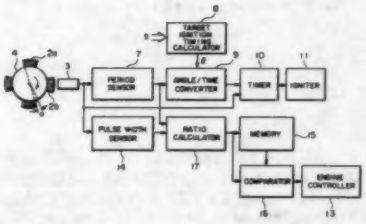
further comprising auxiliary pump means responsive to timing and control signals provided by said sequencing means for providing samples to said cold cranking simulator measuring chamber when pressure in said conduit is below a predetermined threshold value.

4,959,996

CONTROL SIGNAL GENERATOR FOR AN INTERNAL COMBUSTION ENGINE

Masahira Akasu, Himeji, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 26, 1989, Ser. No. 412,738
Claims priority, application Japan, Sep. 27, 1988, 63-239742
Int. Cl.[5] G01M *15/00*
U.S. Cl. 73—116 5 Claims



1. A control signal generator for a multi-cylinder engine comprising:

a rotational position sensor for generating for each cylinder a signal indicating a first rotational position and a second rotational position of a crankshaft of the engine, the first and second rotational positions corresponding to first and second positions with respect to top dead center of a piston of each cylinder, the period between the first and second rotational positions being different for a prescribed reference cylinder of the engine than for the other cylinders of the engine;

first period measuring means responsive to the signal from the position sensor for measuring a first period between consecutive occurrences of one of the rotational positions and generating a corresponding signal;

second period measuring means responsive to the signal from the position sensor for measuring a second period between consecutive first and second rotational positions and generating a corresponding signal;

ratio calculating means for calculating the ratio of the second period to the first period;

a memory for storing the calculated ratio; and

a comparator for comparing the most recently measured ratio with a previously calculated ratio which is stored in the memory and generating a signal indicative of the results of comparison.

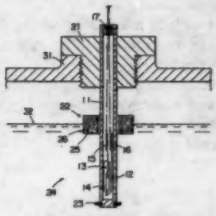
4,959,997

MAGNETIC FLOAT FOR MAGNETIC SENSOR

Junzo Aisa, and Mitsuo Yamamoto, both of Shizuoka, Japan, assignors to Ishikawa Tekko Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 8, 1989, Ser. No. 363,128
Claims priority, application Japan, Oct. 26, 1988, 63-270310
Int. Cl.[5] H01H *35/18*
U.S. Cl. 73—308 7 Claims

1. In a magnet float for a magnetic sensor having a guide tube for guiding the magnetic float, a reed switch mounted in said guide tube, and a lead wire for the reed switch led out to the outside through said guide tube, the improvement characterized by comprising said float magnet being formed of a



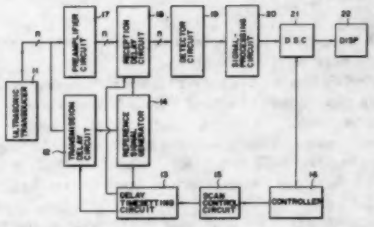
foamed member of synthetic resin including therein a magnetic powder, said magnetic powder being magnetized.

4,959,998

ULTRASONIC IMAGING APPARATUS

Masahiko Yano, Ootawara, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 275,617, Nov. 25, 1988, abandoned. This application Aug. 14, 1989, Ser. No. 394,279
Claims priority, application Japan, Apr. 11, 1986, 61-83818; May 15, 1986, 61-109665
Int. Cl.[5] G01N *29/04*
U.S. Cl. 73—626 10 Claims



1. An ultrasonic imaging apparatus, comprising:

ultrasonic transducer means for emitting ultrasonic beams, receiving echo waves, and outputting echo signals, including an array of ultrasonic transducer elements corresponding to each of a plurality of channels divided into a predetermined number of channel groups;

reception delay circuit means for delaying the echo signals by a delay time, including a plurality of delay units coupled to corresponding ultrasonic transducer elements and divided into a plurality of delay unit groups corresponding to the channel groups;

signal processing means for processing the delayed echo signals and outputting image signals; and

display means for displaying the image signals in the form of a tomogram, wherein:

each delay unit group includes a first delay unit, a last delay unit, and any number of additional delay units, all of the delay units in each delay unit group being sequentially connected in a cascade configuration and having means for outputting a delayed output signal,

each of the delay units includes memory means for writing in and reading out the echo signals,

the echo signals read out of the memory means of the first delay units of each delay unit group are the delayed output signals of the first delay units,

the additional and the last delay units of each delay unit group include first adding means for adding a delayed output signal of a delay unit to the echo signals read out of

the memory means of a sequentially connected delay unit and for outputting an additive output, wherein the additive output is the delayed output signal of the sequentially connected delay unit,

the delay units include addressing means for addressing the memory means by a number of addresses that corresponds to the delay time, and

the reception delay circuit means further includes second adding means for adding the delayed output signals of the last delay units in each of the delay unit groups and outputting delayed echo signals.

4,959,999

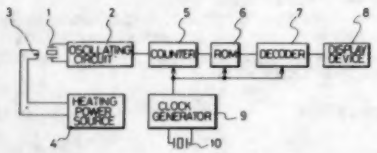
VACUUM GAUGE OF THERMO-CONDUCTIVE TYPE WITH QUARTZ OSCILLATOR

Fujio Tamura, Sendai, Japan, assignor to Seiko Electronic Components Ltd., Japan

Filed Feb. 15, 1989, Ser. No. 311,618

Int. Cl.[5] G01L *21/12*

U.S. Cl. 73—755 **19 Claims**



1. A pressure gauge for measuring the pressure of a gas within a chamber, comprising:

oscillating means disposed within the chamber for undergoing oscillation at a frequency dependant on a body temperature thereof;

heating means disposed adjacent to the oscillating means for heating the oscillating means to hold the body temperature thereof at a level which is dependant on the pressure of the gas;

displaying means for displaying the pressure of the gas according to the oscillation frequency of the oscillating means; and

wherein the oscillating means comprises a temperature-dependent tuning fork quartz oscillator composed of a pair of opposed oscillating portions receptive of the heat transmitted from the heating mans, base portion connecting the pair of oscillating portions to each other, a supporting portion supporting the base portion within the chamber, and a connecting portion connected between the base and supporting portions for reducing the transfer of the heat from the base portion to the supporting portion.

4,960,000

DEVICE FOR MEASURING A PHYSICAL QUANTITY

Fridolin Wiget, Neuchâtel, Switzerland, assignor to Asulab, S.A., Switzerland

Filed Oct. 27, 1989, Ser. No. 427,404

Claims priority, application France, Nov. 2, 1988, 88 14388

Int. Cl.[5] G01B *7/16*

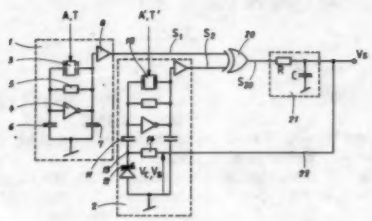
U.S. Cl. 73—778 **11 Claims**

1. A device for measuring a physical quantity comprising:

first oscillating means for producing a first signal having a first frequency representing the physical quantity;

second oscillating means for producing a second signal having a second frequency representing the amplitude of an output signal, said first frequency being independent from said second frequency; and

means for producing said output signal so that its amplitude depends on the phase difference between said first signal



and said second signal, the amplitude of said output signal thus also representing said physical quantity.

4,960,001

TRACTION DYNAMOMETER FOR MEASURING TENSILE FORCES IN THE LAYING OF CABLES

Helmut Vemmer, Wuppertal, Fed. Rep. of Germany, assignor to Peter Lancier Maschinebau-Hafenhütte Gmbh & Co. KG, Muenster-Wolbeck, Fed. Rep. of Germany

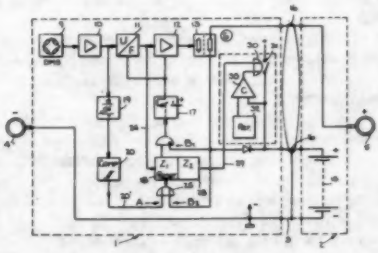
PCT No. PCT/EP88/00207, § 371 Date Nov. 8, 1988, § 102(e) Date Nov. 8, 1988, PCT Pub. No. WO88/07183, PCT Pub. Date Sep. 22, 1988

PCT Filed Mar. 16, 1988, Ser. No. 272,893

Claims priority, application Fed. Rep. of Germany, Mar. 18, 1987, 3708749

Int. Cl.[5] G01L *5/10*

U.S. Cl. 73—862.67 **13 Claims**



1. Tension dynamometer, which in traction connection with a cable serves for detecting the tension forces in the laying of the cable, the dynamometer comprising:

a force measuring sensor,

a voltage-to-frequency converter which is at least one current-consuming element and which converts the signal from the force measuring sensor,

a transfer circuit which uncouples the converted signal of the force measuring sensor and transfers it to a reading station,

a storage battery to supply power to the above components,

the dynamometer additionally including a time switch which interrupts the supply of current of at least one current-consuming element thereof after a predetermined period of time t_1 of steady tension force, and does not turn it back on again until a tension force change occurs.

4,960,002

SAMPLER FOR LIQUID SUBSTANCES

Ilkka Isotalo, Rossinkatu 2 E 17, SF-20380 Turku, Finland

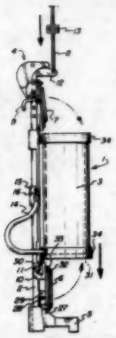
PCT No. PCT/FI88/00022, § 371 Date Aug. 8, 1989, § 102(e) Date Aug. 8, 1989, PCT Pub. No. WO88/06285, PCT Pub. Date Aug. 25, 1988

PCT Filed Feb. 12, 1988, Ser. No. 382,695

Claims priority, application Finland, Feb. 13, 1987, 870608

Int. Cl.[5] G01N *1/12*

U.S. Cl. 73—864.67 **10 Claims**



1. A sampler (1) for liquid substances, comprising a body (2), a sampling container (3) fitted with a sealable bottom (6) and cover (7), as well as means for closing said sampling container (3) of sampler (1) to be immersed in liquid upon a lowering cable (8) at a desired depth by means of a weight (13) dropped along said cable, characterized in that said sampling container (3) is mounted for axial movement on a body (2) external of the container, that said body (2) is provided with a release mechanism (4) for suspending container (3) therefrom in an upper position relative to body (2) upon an open-swung, laterally hinged cover (7), that means are provided for locking in an open position said laterally hinged bottom (6) of container (3) in said upper position, and that said container (3) released by release mechanism (4) is adapted to slide under gravity down along body (2) to a lower position, said cover (7) being adapted to be closed by the action of gravity and bottom (6) and the lower section of body (2) being provided with means which, as container (3) is moving downwards under gravity, force bottom (6) to close and to remain closed.

4,960,003

TRANSMISSION

Joseph A. Hartley, 5064 106th St., Omaha, Nebr. 68127

Filed Aug. 4, 1989, Ser. No. 389,601

Int. Cl.[5] F16H *25/06*

U.S. Cl. 74—63 **3 Claims**

1. A transmission, comprising:

an outer hollow stationary casing means having a first open end, a second closed end, an outer surface and a cylindrical inner surface,

said second closed end having an axially aligned aperture extending therethrough,

said inner surfaces of said casing means having a circumferentially extending, uniformly shaped first zigzag groove formed therein having an amplitude H_1,

said first zigzag groove further comprising a series of uniformly spaced-apart zags, which are angled with respect to the longitudinal axis of said casing means, and a series of uniformly spaced-apart zigs, which are angled with respect to the longitudinal axis of the casing, each of said zigs being positioned between a pair of zags so as to define first and second junctures therebetween,

a first hollow cylindrical member rotatably mounted coaxially within said casing means,

said first cylindrical member having a first open end, a second closed end, an axially aligned output shaft means extending outwardly from said second end, and a plurality of circumferentially spaced apart longitudinally extending parallel slots extending therethrough,

said output shaft of said cylindrical member being journaled in said aperture in said second end of said casing means, each of said slots having a length L1 which is equal to H_1,

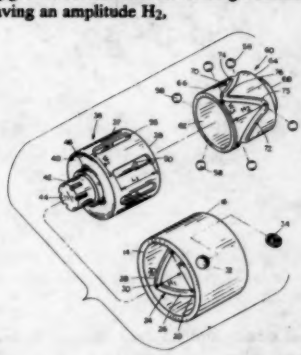
said slots being positioned on said first cylindrical member such that each of said slots has a portion thereof in constant register with said first zigzag groove as said first cylindrical member rotates with respect to said casing means,

a second hollow cylindrical member rotatably mounted coaxially within said first cylindrical member,

said second cylindrical member having a first open end, a second closed end, an input connector means extending outwardly from said closed end and coaxially with said output shaft means, and an outer surface,

said second cylindrical member mounted with its first end adjacent said first cylindrical member second end.

said outer surface of said second cylindrical member having a circumferentially extending, uniformly shaped second zigzag groove formed therein forming a continuous channel having an amplitude H_2,



said second zigzag groove comprising a series of parallel, uniformly spaced-apart zags which are angled with respect to the rotational axis of said second cylindrical member, and a series of parallel, uniformly spaced-apart zigs, which are angled with respect to the rotational axis of said second cylindrical member, each of said zigs being positioned between a pair of zags so as to define first and second, junctures,

said second zigzag groove being positioned on said outer surface of said second cylindrical member such that each of said slots has a portion thereof in constant register with said second zigzag groove as said second cylindrical member rotates with respect to said first cylindrical member,

a bearing operably journaled within each said slot, and between said first zigzag groove and said second zigzag groove, to thereby rotatably support and operably connect said second cylindrical member within said first cylindrical member and said first cylindrical member within said casing means,

the rotation of said input connector means causing the bearings to be moved along the length of said second groove and along the length of said first groove, the movement of said bearings in said grooves causing said first cylindrical member and said output connector means to be rotated,

selective axial movement of said second cylindrical member toward said first cylindrical member preventing the movement of said bearings in said grooves so that said output

shaft will be rotated at the same speed as said input connector means,

said zags of said first zigzag groove being spaced apart at a width W_1; said zags of said second zigzag groove being spaced apart at a width of W_3; said W_1 being greater than W_3 to thereby proportionally reduce the rotation of said first cylindrical member with respect to the rotation of said second cylindrical member, and

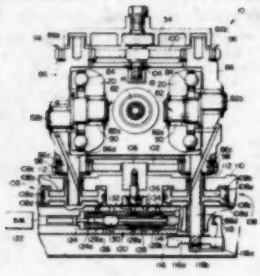
each of said slots being spaced apart at a width of W_2, said W_2 being equal to $\frac{1}{4}$ W_3.

4,960,004

CONTINUOUSLY VARIABLE TRACTION ROLLER TRANSMISSION

Toshifumi Hibi, Yokosuka, and Masaki Nakano, Kawasaki, both of Japan, assignors to Nissan Motor Co., Ltd., Yokohama City, Japan

Filed May 16, 1989, Ser. No. 352,309
Claims priority, application Japan, May 17, 1988, 63-120342
Int. Cl.[5] F16H *15/38*
U.S. Cl. 74—200 **5 Claims**



1. A continuously variable traction roller transmission comprising:

a casing;

input and output toroidal discs arranged in said casing to face each other;

a pair of traction rollers each being disposed between and in engagement with said input and output discs;

roller supporting members respectively supporting said traction rollers through respective eccentrical shafts, each roller supporting member being so arranged that when moved axially, the member is rotated about its axis while pivoting the corresponding traction roller;

hydraulic actuators for axially moving the respective roller supporting members;

a process cam connected to one of said roller supporting members to move therewith;

a speed change instruction means;

a speed change control valve including a first member which is axially moved by said speed change instruction means and a second member which is movable coaxially relative to said first member, said control valve feeding said hydraulic actuators with hydraulic pressure whose magnitude depends on the relative displacement between said first and second members;

a L-shaped pivotal link having one end pivotally connected to said second member and the other end operatively contacting with a cam surface of said process cam; and

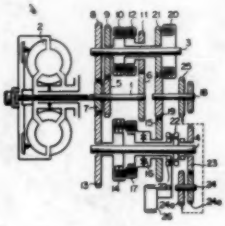
means defined by said cam surface of the process cam, said means increasing a rate of axial movement of the second member to a rotational movement of the roller supporting member when said traction rollers are in a condition for reducing the speed change ratio between said input and output discs but decreasing said rate when said traction rollers are in a condition for increasing the speed change ratio.

4,960,005

AUTOMATIC TRANSMISSION FOR A MOTOR VEHICLE

Hajime Kashiwase, Tokyo, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 31, 1989, Ser. No. 387,357
Claims priority, application Japan, Aug. 11, 1988, 63-201438
Int. Cl.[5] F16H *3/08*
U.S. Cl. 74—329 **1 Claim**



1. An automatic transmission for a motor vehicle having a power transmitting system divided into two gear change units with respect to an input shaft for receiving the power from an engine, said power being transmitted through said units to an output shaft, said units having respective counter shafts and a first gear stage provided between said input shaft and one of said counter shafts, the improvement of the transmission which comprises:

a first counter gear meshed with a first drive gear fixedly supported on said input shaft;

a counter output gear coupled to said first counter gear by a first-gear transmission clutch, a lock up clutch, and a one-way clutch;

a counter reverse gear coupled through idler gears to a reverse input gear fixedly supported on said output shaft; and

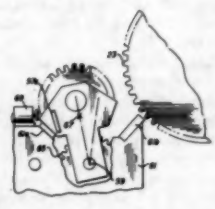
a synchromechanism for selectively coupling said lock up clutch and said counter reverse gear to said counter shaft so as to control engine braking of the vehicle in said first-gear stage by said lock up clutch.

4,960,006

TURNING GEAR ENGAGEMENT DEVICE

James H. Moore, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Sep. 19, 1988, Ser. No. 245,614
Int. Cl.[5] F16H *35/18*
U.S. Cl. 74—384 **9 Claims**



1. An improved turning gear apparatus for rolling a turbomachine rotor by selectively engaging a bull gear on the turbo-

machine rotor, said turbomachine rotor and said bull gear having a horizontal rotor axis of rotation, said turning gear apparatus including a stationary frame mounted adjacent the bull gear,

a carriage pivotally mounted to the stationary frame on a pivoting axis,

a first pinion rotatably mounted on said carriage on a first axis of rotation,

a second pinion continuously engaging siad first pinion and mounted to the stationary frame on a second axis of rotation which is coaxial with said carriage pivoting axis,

a gear train mounted to the stationary frame and engaging said second pinion, and

a turning gear motor for rolling the turbomachine rotor through the gear train and first and second pinions, wherein said improvement comprises:

a portion of the stationary frame supporting said carriage on the side of said bull gear which rotates in an upward direction, said frame portion and said carriage locating said first and second axes of rotation such that when said first pinion engages siad bull gear, the force exerted on said bull gear by said first pinion is substantially in a vertical and upward direction relative to the horizontal rotor axis.

4,960,007

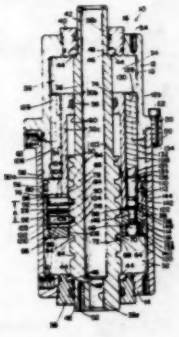
CAM-HELICAL ACTUATOR WITH BACKLASH ELIMINATION

Paul P. Weyer, 48811-284th Ave. SE., Enumclaw, Wash. 98022

Continuation-in-part of Ser. No. 62,504, Jun. 15, 1987, Pat. No. 4,858,486, and a continuation-in-part of Ser. No. 692,293, Jan. 17, 1985, Pat. No. 4,683,767. This application Oct. 5, 1988, Ser. No. 254,374

Int. Cl.[5] F01B *3/00*

U.S. Cl. 74—89.15 **17 Claims**



1. A fluid-powered actuator comprising:

a body having first and second axially spaced-apart ends;

an axially elongated, rotatable shaft positioned within said body and supported for rotation relative to said body, said shaft having a plurality of exterior helical grooves extending over an axial portion of the length of said shaft, each said shaft groove having a pair of elongated, opposing first and second groove sidewalls spaced apart from each other, said first groove sidewall being positioned to one axial side of said groove toward said body first end and said second groove sidewall being positioned to an opposite axial side of said groove toward said body second end;

a piston sleeve reciprocally mounted within said body and having a head portion for application of fluid pressure to one or the other opposing axial sides thereof to produce axial movement of said piston sleeve within said body under fluid-powered operation of the actuator, said piston sleeve further having a sleeve portion positioned toward said body first end, with a central, axially extending opening coaxially receiving said shaft therein said sleeve portion having a plurality of radially extending bores extending fully therethrough and positioned with an inward end bore opening adjacent to said grooved axial portion of said shaft and an outward end bore opening, said sleeve portion having a first end portion positioned toward said body first end;

a plurality of first guide pins, each of said first guide pins being disposed in one of said piston sleeve radial bores, with an inward end pin portion projecting out of said sleeve portion inward end bore opening and into one of said shaft grooves and with an outward end pin portion positioned at said sleeve portion outward end bore opening, said first guide pins transmitting torque between said piston sleeve and said shaft in response to axial movement of said piston sleeve;

an annular pin carrier reciprocally mounted within said body coaxial with said piston sleeve, said carrier having a central, axially extending opening coaxially receiving said shaft therein said carrier having a plurality of radially extending bores extending fully therethrough and positioned with an inward end bore opening adjacent to said grooved axial portion of said shaft and an outward end bore opening, said carrier being adjustably axially movable within at least a limited axial range relative to said piston sleeve without producing relative rotation between said carrier and said piston sleeve, said carrier having a first end portion positioned toward said body first end and a second end portion positioned toward said sleeve portion first end portion;

a plurality of second guide pins, each of said second guide pins being disposed in one of said carrier radial bores, with an inward end pin portion projecting out of said carrier inward end bore opening and into one of said shaft grooves and with an outward end pin portion positioned at said carrier outward end bore opening, said second guide pins transmitting torque between said carrier and said shaft in response to axial movement of said piston sleeve;

a collar mounted within said body coaxial with said piston sleeve, said collar being adjustably rotatable within at least a limited rotational range relative to said piston sleeve and said carrier, said collar having a first end portion threadably engaging said carrier toward said carrier first end portion to produce axial adjusting movement of said carrier relative to said piston on rotational adjusting movement of said collar and a second end portion engaging said piston sleeve first end portion to permit substantially uninhibited rotational adjusting movement of said collar relative to said piston sleeve while inhibiting axial movement of said collar relative to said piston sleeve, said collar being adjustably rotatable in one rotational direction to produce axial adjusting movement of said carrier in one axial direction and adjustably rotatable in an opposite rotational direction to produce axial adjusting movement of said carrier in an opposite axial direction to produce adjustable and oppositely directed axial forces on said sleeve portion and said carrier sufficient to place said first guide pin inward end pin portions in firmly seated engagement with one of either said first or second groove sidewalls and said second guide pin inward end pin portions in firmly seated engagement with the other one of said first or second groove sidewalls to substantially eliminate backlash between said first guide pins and said shaft grooves engaged thereby and between said second guide pins and said shaft grooves engaged thereby as said piston sleeve moves from one axial direction to the other to produce relative rotational movement between said body and said shaft in response to selective application of fluid pressure to said piston sleeve head portion, said collar having a circumferentially extending sidewall portion positioned between said collar first and second end portions and radially outward of said carrier to engage said outward end pin portions of said first and second guide

pins and limit radial movement of said first and second guide pins in a radially outward direction away from said shaft grooves as a result of forces applied thereto by rotational adjusting movement of said collar to eliminate backlash and by fluid-powered operation of the actuator;

a plurality of axially extending, elongated guide members positioned within said body transmitting torque between said piston sleeve and said body in response to axial movement of said piston sleeve, said guide members being attached to said piston sleeve for travel therewith during fluid-powered operation of the actuator, said body having a plurality of guide member receiving portions fixedly attached to said body and slidably engaging a smooth wall portion of at least one of said guide members and preventing rotational movement of said piston sleeve relative to said body while permitting substantially uninhibited reciprocating axial movement of said piston sleeve within said body during fluid powered operation, an end portion of said guide members extending between said piston sleeve and said carrier, said carrier having a plurality of axially extending apertures positioned to slidably receive said guide member end portions therein and prevent relative rotational movement between said carrier and said piston sleeve while permitting substantially uninhibited axial adjusting movement therebetween in response to rotational adjusting movement of said collar relative to said piston sleeve; and

a plurality of threaded lock nuts, each selectively positionable on a correspondingly threaded end of one of said guide member end portions said lock nuts being selectively positionable to engage said carrier and apply a locking axial force between said carrier and said piston sleeve through said collar to lock said carrier to said piston sleeve and prevent axial movement of said carrier to said piston sleeve and prevent axial movement of said carrier relative to said piston sleeve during fluid-powered operation of the actuator, said lock nuts being selectively positionable to permit axial adjusting movement of said carrier relative to said piston sleeve on said guide member end portions within said limited axial range in response to rotational adjusting movement of said collar relative to said piston sleeve.

4,960,008

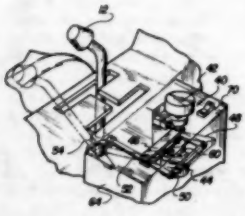
AUTOMOTIVE TRANSMISSION LINKAGE SYSTEM

Frank Y. Yen, 3913 Anvil Dr., Troy, Mich. 48083, and David D. Ardayfio, 25230 Concourse, Southfield, Mich. 48075

Filed Jun. 30, 1988, Ser. No. 214,031

Int. Cl.[5] B60K *20/02*

U.S. Cl. 74—473 R **21 Claims**



1. A system for converting a manual multi-speed transmission to operate as an automatic-manual transmission, the system being disposed within a vehicle, the transmission having a conventional gearshift lever and a clutch pedal, the system comprising:

(a) a gearshift position selection panel, the panel being located apart from the gearshift lever, the panel enabling a driver to select the desired gear position of the gearshift lever by manipulating the panel without the necessity of the driver handling the gearshift lever;

(b) a controller which transforms the gearshift selection of the driver to an output signal, the signal corresponding to the gearshift position selected by the driver; and

(c) actuating means for mechanically repositioning the gearshift lever automatically in accordance with the output signal.

4,960,009

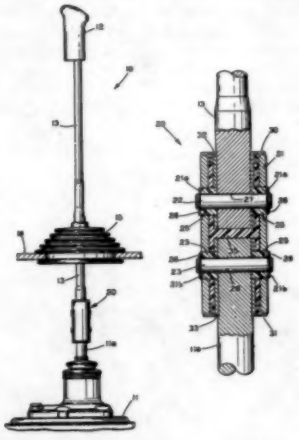
NOISE AND VIBRATION DAMPER FOR A TRANSMISSION SHIFT LEVER

Donald C. Schultz, and James G. Koedam, both of Toledo, Ohio, assignors to Dana Corporation, Toledo, Ohio

Continuation-in-part of Ser. No. 201,508, Jun. 2, 1988, abandoned. This application Sep. 25, 1989, Ser. No. 412,632

Int. Cl.[5] G05G *9/12*

U.S. Cl. 74—473 R **22 Claims**



1. A damper adapted to be connected to an end of a lever member comprising:

a hollow housing having an open end and a pair of apertures formed therethrough;

a hollow liner disposed within said housing having a pair of apertures formed therethrough, said liner adapted to receive therein the end of the lever member extending through said open end of said housing, said liner being spaced apart from said housing to define a radially extending space therebetween;

a pin extending through said pair of housing apertures and said liner apertures;

a pair of bushings formed from a bushing material, said bushings being mounted on the ends of said pin and being disposed within said housing apertures for supporting each end of said pin within said housing apertures; and

vibration dampening material disposed in said radially extending space for connecting said liner to said housing, said bushing material being separate from and relatively rigid in comparison to said vibration dampening material.

4,960,010
DRIVE AND LOCKING SYSTEM

Hans C. Müller, Neckargemünd, and Richard Schopp, Heidelberg, both of Fed. Rep. of Germany, assignors to Teldix GmbH, Heidelberg, Fed. Rep. of Germany

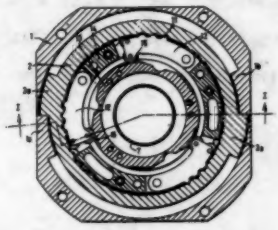
PCT No. PCT/EP87/00749, § 371 Date May 19, 1989, § 102(e) Date May 19, 1989, PCT Pub. No. WO88/04376, PCT Pub. Date Jun. 16, 1988

PCT Filed Dec. 2, 1987, Ser. No. 359,741

Claims priority, application Fed. Rep. of Germany, Dec. 4, 1986, 3641463

Int. Cl.[5] F16H *35/04*; F16D *11/06*

U.S. Cl. 74—640 4 Claims



1. A drive and locking system, comprising:

a stator having a rigid stop portion;

a rotor which is mounted for rotation, with respect to the stator, between first and second end positions which are rotated relative to one another about a predetermined angle, the first end position being determined by the rigid stop portion of the stator;

a drive shaft which is concentric with the rotor;

drive means for rotating the drive shaft;

transmission means for turning the rotor with respect to the stator when the drive shaft is rotated, the transmission means including a drive wheel on the drive shaft, and gear means disposed between the drive wheel and the rotor for driving the rotor; and

locking means for locking the rotor in he first end position, the locking means including

a first member which is disposed concentric with the drive shaft, the first member being connected to the gear means and being rotatable with respect to the stator, the first member having a sloping face,

a second member which is connected to the stator, and

means, including a lever, for connecting the first and second members via the lever until the rotor reaches the first end position, and for thereafter releasing the connection between the first and second members and shifting the lever into engagement with the rotor by way of the sloping face of the first member to lock the rotor in the first end position, the lock being secured by rotation of the first member with respect to the second member.

4,960,011
DIFFERENTIAL DRIVE MECHANISM

Hiroaki Asano, Okazaki, Japan, assignor to Toyoda Koki Kabushiki Kaisha, Kariya, Japan

Filed Jul. 27, 1989, Ser. No. 385,429

Claims priority, application Japan, Jul. 27, 1988, 63-187159

Int. Cl.[5] F16H *35/04*

U.S. Cl. 74—650 4 Claims

1. A differential drive mechanism for automotive vehicles, comprising:

a support casing mounted on a body structure of the vehicle;

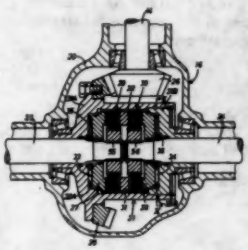
an input shaft rotatably carried on said support casing to be driven by drive torque applied thereto;

a rotary housing rotatably mounted within said support casing and being in drive connection with said input shaft, said rotary housing forming a sealed cylindrical chamber therein;

a pair of split drive axles each arranged coaxially with the rotational axis of said rotary housing for drive connection to a set of road wheels and being rotatably carried by said rotary housing for relative rotation;

a pair of axially spaced pistons slidably disposed within the sealed cylindrical chamber of said rotary housing to be axially inwardly moved by a thrust force applied thereto;

a pair of axially spaced clutch assemblies disposed between said pistons for transmitting the drive torque from said input shaft to said drive axles when engaged by axially inward movement of said pistons;



an intermediate element disposed between said clutch assemblies for applying the thrust force acting on one of said clutch assemblies to the other clutch assembly; and

a pair of rotary members disposed within a pair of annular cavities formed between said pistons and the opposite end walls of said sealed cylindrical chamber and being mounted on said drive axles for rotation therewith, said rotary members each having at least one radial blade which is slidably engaged with said respective pistons and said respective end walls, and said annular cavities each being filled with a viscous fluid.

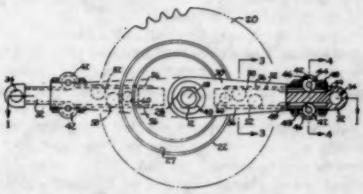
4,960,013
BICYCLE CRANK ASSEMBLY

Keith D. Sander, 12110 Inez St., Whittier, Calif. 90605

Filed Dec. 4, 1989, Ser. No. 445,045

Int. Cl.[5] G05G *1/14*

U.S. Cl. 74—594.3 7 Claims



1. In a bicycle having a main bearing tube for rotary containment of a foot pedal drive shaft; the improvement comprising first and second cam plates affixed to said bearing tube at opposite ends thereof; each cam plate having an outwardly facing endless cam slot extending around the bearing tube axis in eccentric relation thereto; said drive shaft extending through and beyond the bearing tube in both directions so that opposite end portions thereof project beyond the bearing tube and associated cam plates; a sprocket affixed to a first one of the projecting end portions of the drive shaft; a first hollow crank arm affixed to said first projecting shaft end portion outboard from the sprocket; a second hollow crank arm affixed to the

other projecting shaft end portion; individual crank arm extensions slidably mounted within the hollow crank arms for radial movement toward or away from the drive shaft axis; a cam follower extending from each crank arm extension into each associated cam slot; first roller means carried on each crank arm near its outer end for guiding and supporting the associated crank arm extension; and second roller means carried on each crank arm extension near its inner end for rolling contact with interior surfaces of the associated crank arm wherein each said second roller means comprises two rollers (50, 52) having peripheral edge contact with opposite interior side surfaces of the associated hollow crank arm; said two rollers having parallel axles extending normal to the rotational plane of the associated crank arm extension; said rollers being staggered slightly different distances from the inner end of the crank arm extension; each roller (50 or 52) having a diameter greater than one half the thickness of the crank arm extension measured in the crank arm rotational plane.

4,960,014

EXTENSION HANDLE FOR WRENCHES

Roy C. Kelley, 7645 Laytonia Dr., Gaithersburg, Md. 20877

Filed Sep. 19, 1989, Ser. No. 409,331
Int. Cl.[5] B25G *1/04*
U.S. Cl. 81—177.2 **1 Claim**

1. An extension device for increasing the torque applied to a wrench, comprising in combination:

an elongated bar having first and second ends,

said bar having a handle at said first end of said bar,

a first spacer element carried by said bar and mounted adjacent said second end of said bar and extending across said bar in a direction transverse to the direction of elongation of said bar, said first spacer element comprising means for spacing a wrench away from said bar, said first spacer element having at least one end,

a second spacer element carried by said bar and mounted further from said second end of said bar than said first spacer element and extending across said bar in a direction generally parallel to said first spacer element, said second spacer element comprising means for spacing a wrench away from said bar, said second spacer element having at least one end,

first force applying means connected to an end of said first spacer element and extending away from said first spacer element in a direction generally away from said bar for applying a force to a wrench, said first force applying means and said first spacer element defining a slot having an open end through which a wrench may be inserted into said slot, and

second force applying means connected to an end of said second spacer element and extending away from said second spacer element in a direction generally away from said bar for applying a force to a wrench, said second force applying means and said second spacer element defining a second slot having an open end through which a wrench may be inserted into said slot,

each of said open ends facing in a direction opposite to the direction that the other open end faces, so that the first and second force applying means comprise means for applying a torque to a wrench located in said slots.

4,960,015

EXTENDABLE TORQUE BAR

Charlie V. Mathews, P.O. Box 293; Parker St., Reynolds, Ga. 31076

Filed May 2, 1990, Ser. No. 517,742
Int. Cl.[5] B25G *1/04*
U.S. Cl. 81—177.2 **7 Claims**

1. An extendable torque bar comprising:

a multi-sided rack member having teeth extending along a side, and having a rear end and a front end, and having a first adapter member fixedly attached adjacent said front end;

a tubular member defining a multi-sided bore corresponding to said multi-sided rack member, for receiving said multi-sided rack member, said multi-sided bore and said tubular member defining an opening at a front end of said tubular member and defining a slot through a side of said multi-sided bore proximate said front end, and having a rear end and a second adapter member fixedly attached adjacent said rear end, said multi-sided rack member slidably inserted in said tubular member through said opening of said tubular member with said side of said multi-sided rack member having teeth facing said side of said multi-sided bore which defines said slot;

an annular member defining an opening in a circumference of said annular member, said annular member securely attached around said tubular member with said opening in a circumference of said annular member positioned over said slot, said annular member having a frusto-conically-shaped outer surface diverging toward said front end of said tubular member;

a pawl having at least one tooth, a sloped edge distal said at least one tooth, and a portion between said at least one tooth and said slopped edge that does not contain teeth, said pawl movably inserted through said opening of said annular member, with said at least one tooth of said pawl projecting through said slot in said tubular member and said sloped edged coincident with a plane defined by said frusto-conically-shaped outer surface of said annular member when said at least one tooth of said pawl fully engages said teeth of said multi-sided rack member;

a pivot member projecting through said annular member across said opening in said annular member and through said pawl so that said pawl is pivotable about said pivot member;

a sleeve slidably fitting over said annular member and around said tubular member proximate said annular member, said sleeve member having an outer surface, a top end and bottom end, and defining an inner surface at said top end having an inverted frusto-conical shape corresponding to said frusto-conically-shaped outer surface of said annular member, said sleeve member defining a cylindrical inner surface at said bottom end corresponding to said tubular member, said sleeve member slidably engaging said tubular member adjacent said annular member with said top end adjacent said annular member; and

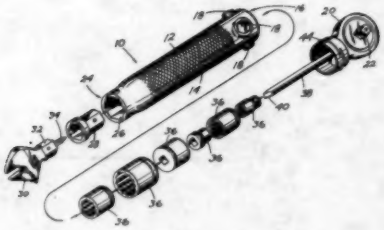
bias means urging said sleeve member against said annular member.

4,960,016

MULTIPURPOSE AUTOMOTIVE TOOL KIT

Robert L. Seals, 13524 Autumn La., Chico, Calif. 95926

Filed Feb. 12, 1990, Ser. No. 478,451
Int. Cl.[5] B25G *1/00*
U.S. Cl. 81—177.4 **5 Claims**



1. A multipurpose automotive tool kit having a variety of tools removably attached to and stored in a tubular housing with said housing adapted by releasable fittings as an attachable handle for said tools, said housing structured adjacent a first terminal end in a side wall surface with at least one inherent socket wrench and removably affixed at said first terminal end with a protruding socket drive ratchet head, said socket driver ratchet head affixed to a shank internally disposed in said housing, said shank being a slide-on retainer for different sized open ended socket wrenches compatible with said socket driver ratchet head and removably stored in said housing, said housing shaped at a second terminal end into a first spark plug tool, there being a second spark plug tool for small sized spark plugs removably fitting inside of said first spark plug tool with said second spark plug tool providing removable retention for a base attached to an adjustable end wrench head protruding externally from said second terminal end of said housing.

4,960,017

HAND TOOL FOR MOUNTING OR DISMOUNTING BICYCLE CRANKS

K. H. Hsiao, No. 4, Lane 11, Tzu Chiang St., Tu Cheng Shiang, Taipei Shien, Taiwan

Filed Jun. 29, 1989, Ser. No. 372,831
Int. Cl.[5] B25B *23/00*
U.S. Cl. 81—459 **2 Claims**

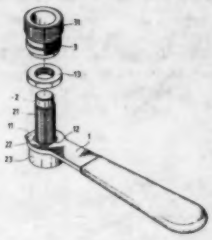
1. A hand tool for mounting or dismounting a bicycle crank comprising:

(a) a handle including a front end;

(b) a wedge extending from the front end for engaging the notch of a bicycle crank lock nut;

(c) a square-shaped hole extending through the front end;

(d) a bolt including a hexagonal-shaped socket at one end, a threaded portion and a square portion positioned between the socket and threaded portion, the square portion being engageable within the square-shaped hole of the front end; and



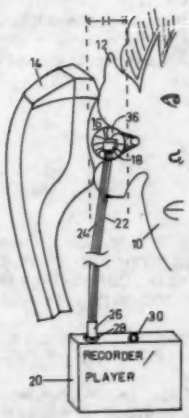
(e) a sleeve rotatably mounted on the threaded portion of the bolt and including an outer threaded portion for threaded engagement with the inner thread of a bicycle crank.

4,960,018

METHOD OF MAKING AND USING MICROPHONES FOR RECORDING TELEPHONE CONVERSATIONS

Marvin S. Towsend, Rockville, Md., assignor to Genvention, Inc., Rockville, Md.

Continuation-in-part of Ser. No. 115,857, Nov. 2, 1987, Pat. No. 4,862,509. This application Dec. 6, 1988, Ser. No. 280,582
Int. Cl.[5] B26D *1/00*
U.S. Cl. 83—13 **5 Claims**



1. A method for providing a microphone for use in recording telephone conversation, the microphone for use in a sound chamber defined by a telephone earpiece in contact with a listener's ear, the method comprising the steps of;

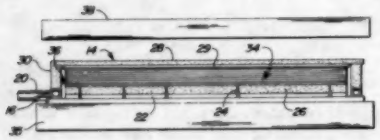
obtaining a speaker whose transducer is small enough to fit into the sound chamber but whose housing is too large to fit into the sound chamber, reducing the size of the housing so that it is small enough to fit into the sound chamber.

4,960,019

VACUUM DIE CUTTING METHOD AND APPARATUS

Martin M. Levene, and William W. Lessard, both of Kitchener, Canada, assignors to Ontario Die Company, Ltd., Ontario, Canada

Continuation-in-part of Ser. No. 107,747, Oct. 13, 1987, Pat. No. 4,852,439. This application Jul. 21, 1988, Ser. No. 222,031
The portion of the term of this patent subsequent to Aug. 1, 2006, has been disclaimed.
Int. Cl.[5] B26D *7/02*
U.S. Cl. 83—19 26 Claims



1. A method of cutting compressible materials comprising:
(a) providing a generally planar support structure;
(b) providing an upwardly facing cutting edge on said support structure;
(c) positioning a layer of compressible material over said cutting edge;
(d) forming an enclosure over said layer of material and over said cutting edge including a top wall overlying said layer of material, collapsible side walls extending downwardly from said top wall, and a rigid annular structure secured to the lower edge of said side walls and adapted to seal on said support surface in circumferentially surrounding relation to said cutting edge and said layer of material;
(e) evacuating air from said chamber through said rigid annular structure to vertically collapse said side walls to an extent to vertically compress said layer of material and substantially reduce its vertical thickness and to press said compressed reduced thickness layer of material downwardly against said edge; and
(f) moving said cutting edge through said compressed reduced thickness layer of material to cut a fixed pattern in the material corresponding to the shape of the cutting edge.

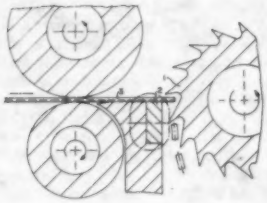
4,960,020

STRAND CUTTER WITH BED KNIFE THAT CAN BE REPLACED DURING OPERATION

Michael Reinhard, Waldstr. 9, D-6117 Schnaefheim, Fed. Rep. of Germany

PCT No. PCT/DE88/00159, § 371 Date Nov. 16, 1988, § 102(e) Date Nov. 16, 1988, PCT Pub. No. WO88/06959, PCT Pub. Date Sep. 22, 1988
PCT Filed Mar. 16, 1988, Ser. No. 290,103
Claims priority, application Fed. Rep. of Germany, Mar. 16, 1987, 3708453
Int. Cl.[5] B26D *7/08*
U.S. Cl. 83—34 25 Claims

16. A method for cutting a plurality of strands with a strand cutter comprising a cutting rotor having a plurality of cutting knives extending therefrom and a linear bed knife disposed adjacent said rotor, rotation of said rotor cutting said strands at said bed knife, said method comprising the steps of:
feeding the strands in a first direction such that said strands move in a plane towards the cutting rotor and the bed knife; and



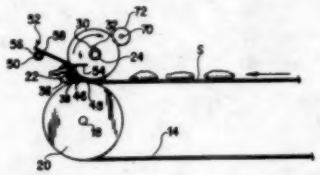
non-reciprocally feeding said bed knife in a second direction perpendicular to said first direction and parallel to said plane.

4,960,021

MEAT SLICER

Donald R. Carney, 320 Riverside Dr., Seaford, Del. 19973, and Daniel Fisher, 200 Oak Ave., New Holland, Pa. 17557

Filed Aug. 14, 1989, Ser. No. 393,365
Int. Cl.[5] B26D *1/24*
U.S. Cl. 83—120 7 Claims



1. An apparatus for cutting meat into strips, comprising
a frame,
a conveyor belt, having an upper surface for moving meat cuts placed thereon,
a driveshaft mounted for rotation on said frame, parallel to and above said conveyor belt surface,
a plurality of circular cutter blades mounted at intervals along said driveshaft, said blades having peripheries spaced slightly above said belt surface,
a second, rotatable shaft supported by said frame and extending parallel to the driveshaft,
a plurality of pressure wheels mounted on said shaft, said pressure wheels being of such diameter as to extend slightly between adjacent of said cutter blades, so as to maintain spacing between the blades,
said belt surface, said cutter blades, and said pressure wheels defining a volume therebetween, and
a wedge element confined within said volume, said element being free to float within said volume, said wedge having a leading edge for separating meat from the conveyor surface.

4,960,022

PLASTIC FILM CUTTER

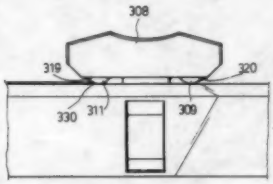
Kuo C. Chuang, 1 Fl., No. 2, Alley 1, Lane 394, Chung Cheng N. Road, Sanchung, Taipei Hsien, Taiwan

Filed Mar. 7, 1989, Ser. No. 319,769
Int. Cl.[5] B26D *7/14, 5/08, 7/00*
U.S. Cl. 83—175 10 Claims

1. A plastic film cutter, comprising:
means housing a supply of plastic film to be cut;
a furrow fixedly supported within the vicinity of said hous-

ing means and including an upper surface upon which a portion of said plastic film may be supported during a cutting operation;

a cutting means, including at least one cutting blade, slidably supported upon said furrow for cutting said plastic film during movement of said cutting means along said furrow from one end portion of said furrow to another end portion of said furrow; and



roller means, disposed within said cutting means and upon opposite sides of said at least one cutting blade, for engaging said plastic film disposed upon said upper surface of said furrow so as to rollably support said cutting means upon said furrow and to maintain said plastic film in a tensioned state while said at least one cutting blade cuts said plastic film.

4,960,023

CROSS-CUT SAWING OF BOARDS BY SAW BLADES MOUNTED ON TRANSVERSELY ADJUSTABLE CARRIERS

Alfred Reuter, Oberkirch, and Günter Klumpp, Kehl, both of Fed. Rep. of Germany, assignors to Gebruder Linck Maschinenfabrik "Gatterlinck" GmbH & Co. KG, Oberkirch, Fed. Rep. of Germany

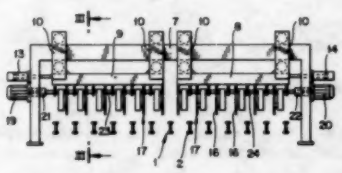
PCT No. PCT/EP87/00321, § 371 Date Dec. 5, 1988, § 102(e) Date Dec. 5, 1988, PCT Pub. No. WO88/00113, PCT Pub. Date Jan. 14, 1988

PCT Filed Jun. 20, 1987, Ser. No. 294,604

Claims priority, application Fed. Rep. of Germany, Jun. 26, 1986, 3621357

Int. Cl.[5] B27B *5/22, 31/06*

U.S. Cl. 83—368 **5 Claims**



1. Circular cross-cut sawing apparatus for cutting boards to length, comprising:

conveyor means for conveyor boards lying transversely of a direction of conveyance,

first and second saw carriers mounted for separate movement in a direction transversely of said direction of conveyance,

a plurality of transversely spaced sawing units mounted on each of said first and second saw carriers,

means for transversely adjusting said first and second saw carriers relative to one another such that at least some of the boards are each cut by saw units of both of said first and second saw carriers,

first and second motor-driven drive shafts transversely mounted on said first and second saw carriers, respectively,

said sawing units of said first and second saw carriers including arms pivotably mounted to respective ones of said first and second drive shafts, and rotary saw blades mounted on said arms,

rotation transmitting means interconnecting said saw blades with respective ones of said drive shafts,

first and second drive means for continuously rotating said first and second drive shafts, respectively, for continuously rotating said saw blades, and

means for separately rotating said arms about said drive shafts for adjusting the heights of said saw blades.

4,960,024

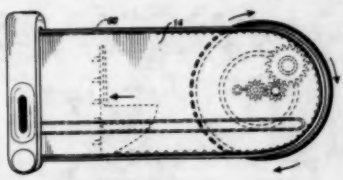
CHEESE DISPENSER

David A. Holcomb, Seattle, Wash., assignor to Chef'N Corporation, Seattle, Wash.

Filed Mar. 30, 1989, Ser. No. 332,169

Int. Cl.[5] B67D *5/42, 5/22;* B26D *7/00*

U.S. Cl. 83—423 **11 Claims**



8. A solid food dispenser, comprising:

a compartment formed by a closed top, bottom, rear end, and side walls, and a completely open front end;

a flexible cover;

a pusher for pushing said food from said compartment;

guideways disposed within said compartment for guiding said flexible cover and said pusher such that said cover can close said open front end to seal the inside of said compartment, said guideways including a lower set of guideways extending lengthwise of the compartment and having open ends at the front end of the compartment for moving the cover outwardly along an unobstructed path such that said cover and said pusher can be removed from said compartment; and

means for simultaneously moving said cover and said pusher.

4,960,025

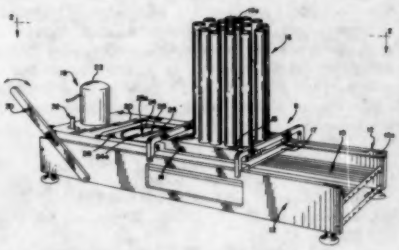
APPARATUS FOR SLICING MEAT STICKS

Clifford E. Fitch, R.R. #2 - Box 74C, Beecher, Ill. 60401

Filed Oct. 13, 1989, Ser. No. 421,337

Int. Cl.[5] B26D *7/06*

U.S. Cl. 83—703 **10 Claims**



1. An apparatus for slicing sticks of food product and applying it to a substrate comprising:

a cutting mechanism including a platter having a platter surface for supporting said substrate, a ring having an inner cutting surface in spaced relationship with said platter surface, said ring inner cutting surface having an upper and lower surface, said ring inner cutting surface being outwardly tapered from said upper surface to siad lower surface, and means for rotating said ring;

means for delivering a food product stick through said ring opening and into contact with said platter surface; and

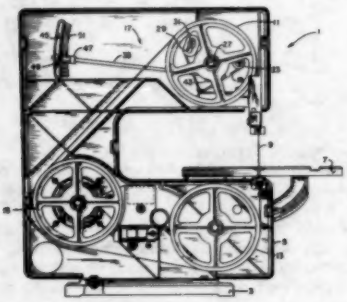
means for moving said platter and said ring in tandem relative to said food product stick delivery means, said moving operative to cause said inner cutting surface to slice said food product stick.

4,960,026

QUICK ACTION BAND SAW BLADE TENSIONING DEVICE

Daniel A. Terpstra, Kirkwood, Mo., assignor to Emerson Electric Co., St. Louis, Mo.

Filed Oct. 11, 1989, Ser. No. 419,960
Int. Cl.[5] B26D *1/48*
U.S. Cl. 83—818 **20 Claims**



1. A band saw machine including a supporting frame, at least upper and lower band saw supporting wheels operatively rotatably mounted to the supporting frame, a band saw entrained and driven about the upper and lower band saw supporting wheels, and a band saw tensioning assembly including a wheel support pivotally mounted to the supporting frame about a wheel support pivotal mount, one of said upper and lower band saw supporting wheels being rotatably mounted to the wheel support about a wheel support rotatable mount, a flexible elongated wire spring for adjustably pivotally moving the wheel support and its rotatably mounted band saw supporting wheel about the wheel support pivotal mount so as to apply a tensioning force to the band saw as desired, said flexible elongated wire spring having first and second ends, one of said ends being fixed to said wheel support and the other of said ends being adjustably movable in a predetermined arc about the wheel support pivotal mount, said flexible elongated wire spring when adjustably moved in the predetermined arc bending throughout the length thereof for imparting a moment to the wheel support pivotal mount in order to apply a tensioning force to the band saw blade, and means for holding said other end of the elongated wire spring at various positions along the predetermined arc.

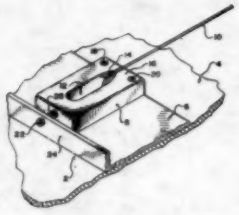
4,960,027

BRIDGE FOR A STRINGED INSTRUMENT

Dave Dunwoodie, 11200 - 7th Avenue, Richmond, B.C., Canada (V7E 3B9)

Filed Dec. 30, 1988, Ser. No. 292,531
Int. Cl.[5] G10D *3/04*
U.S. Cl. 84—307 **12 Claims**

1. A bridge for a stringed instrument having a string supporting portion made of an essentially rigid lubricating composition comprising a generally homogeneous mixture of a first component or constituent and a second component or constituent, the first component being an essentially rigid plastic resin material, and the second component being a lubricating material containing one or more ingredients selected from a group comprising polytetrafluoroethylene, a silicone and graphite, the components being in a proportion sufficient to provide adequate lubrication for strings passing over the bridge to reduce frequency of string breakage.

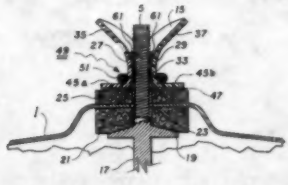


4,960,028

QUICK-RELEASE CYMEAL MOUNTING FASTENER

Anthony Ramirez, 804 Fern St., Escondido, Calif. 92027

Filed Sep. 11, 1989, Ser. No. 405,196
Int. Cl.[5] G10G *5/00*
U.S. Cl. 84—421 **15 Claims**



1. In a cymbal mounting arrangement, including a cymbal rod having an upwardly directed threaded end, for receipt thereover of a cymbal, the improvement comprising a quick-release fastener to retain the cymbal on the rod, the fastener comprising:

(a) a pair of half-round sleeve members arranged in face-to-face relationship forming a cylindrical surface therebetween for grasping the cymbal mounting rod;

(b) a tab extending upward from each sleeve member including means for pivoting said members near said tabs so that, by squeezing said tabs together, said sleeve members are pivoted away from each other;

(c) pair of split flange members, one attached to the lower end of each sleeve member, spaced apart from said tab, arranged in co-planar alignment when said members are in adjacent contact to form a planar compression surface for pressing toward a cymbal placed on the cymbal mounting rod; and,

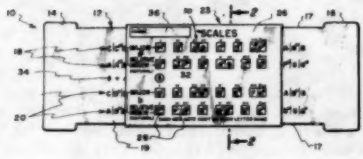
(d) means for biasing said sleeve members into full contact about the cymbal mounting rod threaded end to hold the cymbal on the rod.

4,960,029

MUSICAL SCALE DETERMINING DEVICE

Michael B. Nelson, 7 Stephen Court, Nunawading Victoria 3131, Australia

Filed Nov. 13, 1989, Ser. No. 434,303
Int. Cl.[5] G09B 15/02
U.S. Cl. 84—473 3 Claims



1. A musical scale determining device comprising:

a thin sheet material body having a front surface and a back surface, said body having enlarged end sections with a necked-down section located therebetween;

first indicia printed on said front surface, said first indicia denoting conventional musical note representations, said first indicia being arranged in a first specific arrangement, said first specific arrangement comprising a plurality of longitudinally oriented rows of musical notes divided into a first upper section and a first lower section, therebeing the same number of musical notes in both said first upper and first lower sections, said first upper section including the sharps of said musical notes and no flats, said first lower section including the flats of said musical notes and no sharps;

a cursor movably mounted longitudinally on said necked-down section of said body, said cursor having limits of movement on said body defined by said enlarged end sections, said cursor being permanently attached to said body with disengagement not being possible under normal use of said device, said cursor including second indicia, said second indicia for denoting conventional musical scales, said scales to be visually observed from said first indicia when said cursor is positioned directly adjacent said first indicia, said cursor is locatable at various longitudinal positions relative to said first indicia and at each said position at least a single said musical scale is to be observable;

third indicia printed on said back surface, said third indicia comprising conventional musical notes, said third indicia being arranged in a second specific arrangement, said second specific arrangement comprising a plurality of vertical rows of said musical notes divided into a second upper section and a second lower section, the number of said musical notes in said second upper section equals the number of said musical notes in said second lower section; and

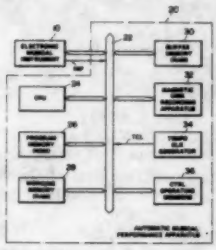
fourth indicia located on said cursor, said fourth indicia for ascertaining the primary triads for major keys of music with said primary triads to be selected from said third indicia, said fourth indicia is to be locatable at various longitudinal positions relative to said third indicia and at each said position at least a single said primary triad is to be observable.

4,960,030

AUTOMATIC MUSICAL PERFORMANCE APPARATUS HAVING REDUCED WAIT TIME

Junichi Fujimori, Hamamatsu, Japan, assignor to Yamaha Corporation, Hamamatsu, Japan

Continuation of Ser. No. 52,036, May 18, 1987, abandoned. This application Dec. 13, 1989, Ser. No. 453,059
Claims priority, application Japan, May 23, 1986, 61-118744
Int. Cl.[5] G10H 1/36, 7/00
U.S. Cl. 84—609 14 Claims



9. A method for storing, on a recording medium music performance data for automatic playback of a musical performance or an electronic musical instrument, comprising the steps of:

producing music performance data corresponding to a particular musical performance using the electronic musical instrument;

sequentially transferring the produced music performance data to a buffer memory for temporary storage at a transfer rate dependent on the particular musical performance, the buffer memory having a data transfer capability greater than that of said recording medium;

sequentially transferring data from the buffer memory to recording medium;

determining transfer control information representing a wait time for initially loading the buffer memory with data from the recording medium, the transfer control information being dependent on said transfer rate; and

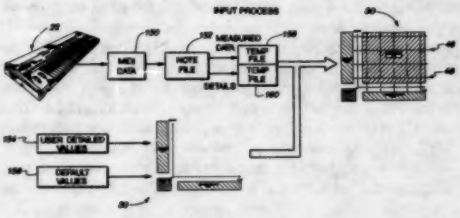
storing the determined tranfer control information in the recording medium at a designated memory location.

4,960,031

METHOD AND APPARATUS FOR REPRESENTING MUSICAL INFORMATION

Philip F. Farrand, Springfield, Mo., assignor to Wenger Corporation, Owatonna, Minn.

Filed Sep. 19, 1988, Ser. No. 245,565
Int. Cl.[5] G09B 15/04; G10G 3/04; G10H 1/42, 7/00
U.S. Cl. 84—609 28 Claims



27. A method for processing musical information comprising the steps of:

inputting the musical information into a programmable data processing means for electronically representing the musical information;

identifying a plurality of measures in the musical information;

assigning a time dimension value to each measure;

identifying at least one instrument in the musical information;

assigning a sound dimension value to each instrument;

storing the musical information for a given instrument and measure by storing the time dimension value and the sound dimension value assigned to the given instrument and measure and storing the musical information associated with the given instrument and measure.

4,960,032

APPARATUS FOR LOCKING AND UNLOCKING A SAFETY FOR SUBAMMUNITION BODIES

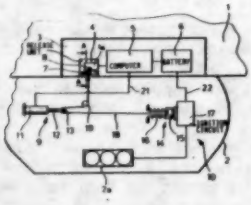
Horst Huetter, Tegernsee, Fed. Rep. of Germany, assignor to Messerschmitt-Boelkow-Blohm GmbH, Munich, Fed. Rep. of Germany

Filed Oct. 4, 1989, Ser. No. 416,931

Claims priority, application Fed. Rep. of Germany, Oct. 5, 1988, 3833817

Int. Cl.[5] B64D *1/04;* F42C *15/12*

U.S. Cl. 89—1.51 6 Claims



1. An apparatus for locking and unlocking a safety device for subammunition bodies suitable for discharge from a carrier, comprising a container for holding said subammunition bodies (2*a*), control means including release means (4), safety means (14, 25) for permitting or preventing said discharge, rope pull means (18) operatively interconnecting said release means (4) and said safety means, said release means including a pin (8) shiftable between a first safety-on position and a second safety-off position, one end (7) of said rope pull means (18) looping around said pin (8), the other end of said rope pull means being connected to said safety means, said pin (8) being capable of releasing said looping end (7) from said pin in said safety-on position, said apparatus further including drive means (4*a*) for said pin (8) in said release means, whereby a small force is sufficient for removing said looping end (7) from said pin (8) when said pin is in said first safety-on position, said pin (8) passing fully through said looping end (7) when said pin is in said safety-off position so that a large force is required to shear off said pin (8) for releasing said looping end, operating means (9) for operating said rope pull means (18) comprising a drive rod (12) carrying a pulley (13) engaging said rope pull means (18) for driving said rope pull means with an operating force which is larger than said first mentioned small force and substantially smaller than said second mentioned force, said control means further comprising a computer (5) connected to said release means (4) and to said operating means (9), said computer providing instruction signals for operating said pin (8) and/or said drive rod (12) in accordance with a program and in accordance with the type of use for which said subammunition bodies are intended.

4,960,033

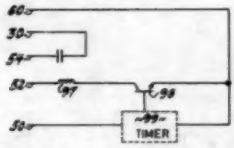
GUN FIRING RELAY CIRCUIT

Chester C. Quantz, Valley Hills, Tex., assignor to Electro-Tech, Inc., Westland, Mich.

Filed Dec. 27, 1988, Ser. No. 290,164

Int. Cl.[5] F41A *19/60*

U.S. Cl. 89—28.05 17 Claims



1. An electronic circuit for coupling an electrical power supply to a gun firing output for one predetermined time interval upon assertion of a gun triggering input if, and only if, a gun arming input is electrically asserted, comprising:

an electrically actuated switch having a switching input, said electrically actuated switch to couple the electrical power supply to the gun firing output upon receipt of a switching signal upon said switching input;

a timer circuit having an input connected to the gun triggering input and an output connected to said switching input of said electrically actuated switch, for transmitting said switching signal to said switching input of said electrically actuated switch for the predetermined time interval upon assertion of the gun triggering input, said timer circuit including

a voltage regulator having an input connected between the gun triggering input and an electrical common, and an output,

a series resistor capacitor network, including a resistor, a capacitor and a node therebetween, connected between said output of said voltage regulator and electrical common,

an attachment junction,

an additional resistor connected beween said output of said voltage regulator and said attachment junction,

a three terminal thyristor having a gate connected to said node between said resistor and said capacitor of said series network, and an anode and cathode connected between said attachment junction and said electrical common, and

means for transferring signals from said attachment junction to said output of said timer circuit; and

means for preventing the transmitting of said switching signal to said switching input of said electrically actuated switch unless the gun arming input is electrically asserted.

4,960,034

FLUID-DRIVEN MULTI-CYLINDER OPERATING UNIT TIRE REMOVAL MACHINES

Remo Corghi, Correggio, Italy, assignor to Corghi Elethromeccanics S.p.A., Parma, Italy

Filed Oct. 3, 1988, Ser. No. 252,388

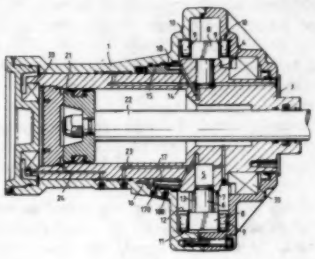
Claims priority, application Italy, May 18, 1988, 46851 A/88

Int. Cl.[5] F01B *13/06;* B60C *25/138*

U.S. Cl. 91—491 5 Claims

1. A fluid-driven multi-cylinder operating unit which is particularly used for tire removal machines which comprises a rotor provided with a plurality of radially disposed, equidistant, coplanar single-acting cylinder-piston units which are fluid-actuated in succession by an annular distributor, their rods interacting, by way of end rollers, with a track which is coaxial to the rotor and fixed to a stator and which includes a succession of semi-cylindrical recesses which are less in number than the number of rotor cylinder-piston units and joined

together by cusps, wherein at an axial center of the rotor there is provided a passage for a rod of a rectilinear cylinder-piston



unit, the rectilinear cylinder-piston unit being fed from the same pressurized fluid source that feeds the radial rotor cylinder-piston units.

4,960,035

CONTROL SYSTEM FOR A HYDRAULIC LIFT DRIVEN BY A VARIABLE DISPLACEMENT PUMP

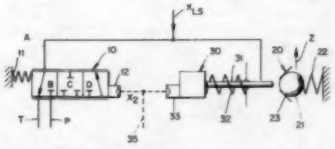
Wolfgang Kauss, Lohr-Wombach, Fed. Rep. of Germany, assignor to Mannesmann Rexroth GmbH, Lohr am Ma³n, Fed. Rep. of Germany

Filed Sep. 22, 1988, Ser. No. 247,863

Claims priority, application Fed. Rep. of Germany, Oct. 5, 1987, 3733679

Int. Cl.⁵ F15B *11/08*

U.S. Cl. 91—445 **6 Claims**



1. A control system for a hydraulic lift driven by a variable displacement pump or the like there being an operating line leading to the hydraulic lift, a pump line leading from the pump, and a tank line leading to a tank; said system comprising a blocking valve in the operating line which may be opened at least for lowering movement of the hydraulic lift, control means for opening and closing the blocking valve and for regulating the volumetric flow selectively from the pump line to the operating line leading to the hydraulic lift, or from the hydraulic lift to the tank line leading to the tank, and a load registration line connected to the operating line for transmitting load pressure to the pump; said control means including an actuator unit for opening and closing the blocking valve, and a servo valve for regulating the volumetric flow to and from the hydraulic lift, said servo valve being movable between a tank position, a valve position, and a neutral position and being biased toward said tank position; said tank position connecting the tank line to the operating line and to the load registration line, said valve position connecting the pump line to the operating line and to the load registration line; said neutral position being situated between said tank and valve positions; the operating line interconnecting said servo valve and said blocking valve in series, whereby fluid conducted through either of said servo valve and blocking valve passes through the other of said servo valve and blocking valve.

4,960,036

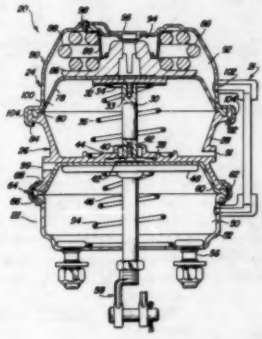
TAMPER-RESISTANT BRAKE ACTUATOR

Allen L. Gummer, Santa Rosa, Calif.; Graydon J. Choinski, Utica, and David W. Brooks, Royal Oak, both of Mich., assignors to Indian Head Industries, Inc., Southfield, Mich.

Filed Nov. 6, 1987, Ser. No. 118,372

Int. Cl.⁵ F01B *7/00*

U.S. Cl. 92—63 **11 Claims**



3. A tamper-resistant fluid-operated brake actuator of the type having a head, a flange case, and a power spring, said power spring being compressed at periods during the operation of said brake actuator such that said power spring exerts a force on said head during said periods of compression, said force of said spring tending to separate said head from said flange case, said tamper-resistant brake actuator comprising:

a flange case having an annular flange which extends generally radially outwardly at least partially around said flange case;

a head having a chamber and an annular rim;

a power spring, said power spring being at least partially disposed in said chamber of said head;

an annular metal retaining member attaching said head to said flange case;

said annular metal retaining member having a substantially continuous curvilinear ring-shaped portion, said curvilinear ring-shaped portion having a channel substantially coextensive therewith;

said annular metal retaining member being positioned on said head and said flange case with said annular rim and said annular flange engaged by said annular metal retaining member within said channel of said annular metal retaining member;

said annular metal retaining member being deformed beyond its elastic limit to tighten said annular metal retaining member in place onto said annular rim and said annular flange;

said head being rigidly secured to said flange case by said annular metal retaining member, such that said flange case and said head resist the force of said power spring during said periods of compression and preventing removal of said head from said flange case and release of said power spring;

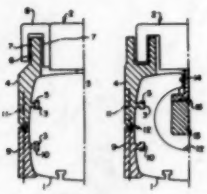
said annular metal retaining member must be deformed beyond its elastic limit.

4,960,037

APPARATUS IN PRESSURIZED FLUID CYLINDERS NOT HAVING PISTON RODS

Bo Granbom, Södergatan 5, S-736 00 Kungsör, Sweden

Filed Feb. 22, 1989, Ser. No. 313,476
Claims priority, application Sweden, Mar. 14, 1988, 8800908
Int. Cl.[5] F01B 29/00
U.S. Cl. 92—88 4 Claims



1. An apparatus comprising:

a cylinder device having a longitudinal axis and a cylindrical wall, said cylindrical wall having a slit defined therethrough and at least one longitudinally extending slot defined in an outside surface thereof, said at least one slot being parallel to a longitudinal axis of said cylinder;

a slidable piston disposed within said cylinder, said piston having a longitudinal axis;

a dog for said piston, said dog extending through said slit in said cylindrical wall;

said dog having an engagement portion defined longitudinally thereof, said engagement portion having at least first and second engagement surfaces defined in planes which are laterally offset from a plane containing said slit and said longitudinal axis of said piston;

a sealing strip for sealing said slit; and

a support part having at least one longitudinally extending rail element disposed in a slot in the outside surface of the cylindrical wall so that said support part is radially fixed with respect to said cylinder device, said support part further including an engaging portion, said engaging portion including at least first and second engaging surfaces, said engaging surfaces of said engaging portion of said support part being parallel to respective engagement surfaces of said engagement portion of said dog.

4,960,038

DIAPHRAGM DEVICE

Masaaki Chiba, and Hideki Maruhashi, both of Himeji, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 2, 1988, Ser. No. 265,985
Claims priority, application Japan, Nov. 9, 1987, 62-282554; Nov. 9, 1987, 62-282555; Nov. 9, 1987, 62-282556
Int. Cl.[5] F01B 19/00; F16J 3/00
U.S. Cl. 92—98 R 3 Claims

1. A diaphragm device, comprising:

a housing;

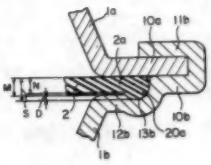
a diaphragm extending in said housing to define an airtight chamber therein:

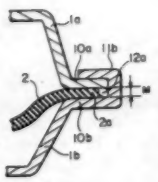
clamping means for clamping a marginal portion of said diaphragm in airtight engagement said clamping means including a first and a second surface tightly clamping said marginal portion of said diaphragm therebetween;

distance regulating means for regulating the distance between said first and second surfaces of said clamping means to a predetermined magnitude to control a reduction in thickness of said clamped marginal portion of said diaphragm with respect to a thickness thereof in a free state, the reduction in thickness being caused by a pressure exerted thereon by said first and second surfaces of said clamping means; wherein said housing includes two cup-shaped members coupled to each other at marginal portions thereof, said cup-shaped members each having a radially outwardly extending flange formed at the marginal portion thereof;

said clamping means includes said radially extending flanges of said cup-shaped members, annular surfaces of said flanges facing toward each other constituting said first and second surfaces of the clamping means and clamping an outer marginal portion of said diaphragm therebetween, wherein a peripheral portion of the flange of one of said cup-shaped members is bent first axially toward the other cup-shaped member, and then radially inwardly over the flange portion of the cup-shaped member, to form a radially inwardly open U-shaped cross-sectional clamping structure,

said distance regulating means comprises an annular step formed in an outer portion of the radially outwardly extending flange of one of said cup-shaped members, the outer marginal portion of the diaphragm being clamped between a stepped-down inner portion of the stepped flange of said one of the cup-shaped members and the annular surface of the flange of the other cup-shaped member, the axial height of said step controlling the thickness reduction of the clamped outer marginal portion of said diaphragm, and





wherein said diaphragm has an annular bead of enlarged thickness formed at the outer marginal portion thereof, and the radially outwardly extending flange of one of said cup-shaped members has an annular groove formed on the annular surface thereof opposing the flange of the other cup-shaped member to receive said annular bead of said diaphragm therein, said diaphragm being tightly clamped between the radially outwardly extending flanges of said cup-shaped members at said bead of enlarged thickness, the sum of the axial height of said step and the axial depth of said groove controlling the thickness reduction of the annular bead formed at the marginal portion of said diaphragm, the remaining portion of the outer marginal

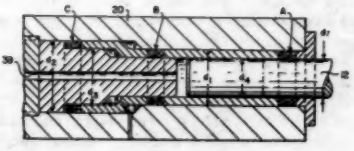
portion of the diaphragm other than said annular bead having a thickness smaller than an axial distance between those portions of the opposing surfaces of the radially outwardly extending flanges of said cup-shaped members which face said remaining portion of the outer marginal portion of said diaphragm other than said annular bead.

4,960,039

CYLINDER WITH SLEEVE COMPACTER SEALS FOR HIGH PRESSURE PUMPS

Jason L. Robertson, Edinboro, Pa., assignor to Hydro-Pac, Inc., Fairview, Pa.

Filed Mar. 14, 1989, Ser. No. 323,502
Int. Cl.[5] F16J *15/18*
U.S. Cl. 92—165 R **18 Claims**



13. An improved cylinder for pumps of the type wherein a plunger moves within a cylinder forcing fluid through a port in a cap fitted into one end of the cylinder comprising:

(a) a cylinder having a longitudinal bore of a selected first diameter and an enlarged vented channel adjacent the bore and at one end of the cylinder;

(b) a cap having a shoulder portion sized and positioned to fit within the bore, a body portion of larger diameter sized and positioned to fit within the enlarged channel and together with the shoulder portion define a vented cavity between the cap and the cylinder, and a base portion larger than the channel, said cap also having a port therethrough;

(c) a sleeve sized and positioned to fit within the cylinder bore to permit the plunger to move therethrough to always overlap the plunger at one end and to have an opposite end which abuts the shoulder portion of the cap;

(d) a first seal encircling the body cap within the channel;

(e) a second seal encircling the shoulder portion of the cap, and within the bore; and

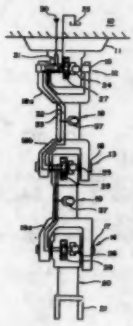
(f) a third seal adjacent an opposite end of the sleeve, within the bore and encircling the plunger.

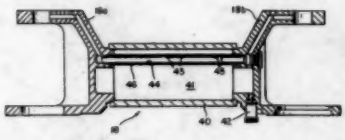
4,960,040

ARM STRUCTURE FOR ARTICULATED MECHANISM

Tomoharu Kumagai, Tokyo; Masato Hirose, Saitama, and Masao Nishikawa, Tokyo, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 23, 1988, Ser. No. 290,246
Claims priority, application Japan, Dec. 30, 1987, 62-332727
Int. Cl.[5] F02F *7/00*; B25J *11/00*
U.S. Cl. 92—261 **17 Claims**





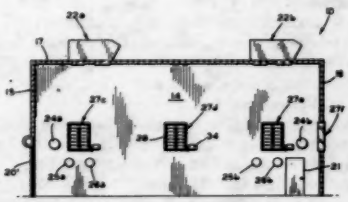
1. An arm structure for an articulated mechanism, comprising a plurality of links operatively interconnected by articulations actuatable under a fluid pressure, each of said links comprising an accumulator for the fluid pressure.

4,960,041

REGULATION OF ATMOSPHERIC CONDITIONS WITHIN A CONFINED SPACE

Thomas E. Kiser, Fremont, Ohio, assignor to Professional Supply, Inc., Fremont, Ohio

Division of Ser. No. 124,912, Nov. 27, 1987, Pat. No. 4,850,264.
This application May 11, 1989, Ser. No. 350,256
Int. Cl.[5] B64D *13/00*
U.S. Cl. 98—1.5 **16 Claims**



1. A method of pressurizing an enclosed building having randomly located, uncontrolled leakage passageways between its interior and exterior, comprising admitting conditioned air to the building interior at a plurality of first locations throughout said building, periodically determining the atmospheric pressure at selected second locations within said building, and

individually regulating the input of said conditioned air at each of said plurality of first locations in response to the observed atmospheric pressure at said selected second locations whereby said input at said plurality of first locations is coordinated to maintain the atmospheric pressure throughout said enclosed building above outside atmospheric pressure.

4,960,042

DEVICE FOR FROTHING AND HEATING MILK FOR BEVERAGES

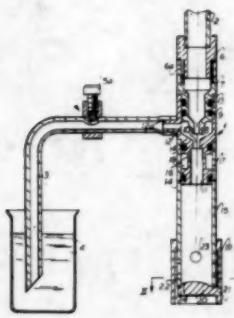
Lucio Grossi, Via Sylva, 30 Bergamo, Italy

Filed May 31, 1989, Ser. No. 359,738

Claims priority, application Italy, Jun. 1, 1988, 20828 A/88; May 26, 1989, 21159 B/89

Int. Cl.[5] A47J *31/40*

U.S. Cl. 99—293 **7 Claims**



1. Device for frothing and heating milk for beverages comprising:

a steam outlet tube which is part of a machine for preparing hot beverages; and

a substantially tubular cylindrical body connected to said steam outlet tube, said body comprising:

a first nozzle positioned within said body;

a first chamber outward of said first nozzle and within said body;

a milk intake tube opening into said chamber;

a vessel communicating with said first chamber through said milk intake tube;

a constricted passage within said cylindrical body and positioned below said first nozzle;

a second nozzle positioned below said constricted passage;

a second chamber within said tubular cylindrical body and radially outward of said constricted passage;

at least one first aperture formed in said tubular cylindrical body communicating with an area outside of said second nozzle;

at least one second aperture formed in a wall of said second nozzle communicating with an area inside of said second nozzle; and

an outlet duct positioned below said second chamber and having an end opening toward an outside of said tubular cylindrical body for delivering frothed milk.

4,960,043

EXTRUDER AND CONTINUOUS MIXER ARRANGEMENT FOR PRODUCING AN AT LEAST PARTIALLY BAKED PRODUCT HAVING A COOKIE-LIKE CRUMB STRUCTURE

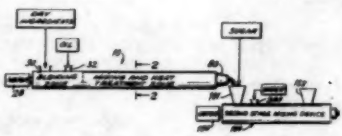
Bernhard H. van Lengerich, Ringwood, N.J., assignor to Nabisco Brands, Inc., East Hanover, N.J.

Filed Jun. 7, 1989, Ser. No. 362,579

The portion of the term of this patent subsequent to Jul. 3, 2007, has been disclaimed.

Int. Cl.[5] A21C *3/04*; A47J *27/12*; A23P *1/00*

U.S. Cl. 99—353 **21 Claims**



1. An apparatus for producing a product having a cookie-like crumb structure, which comprises

an extruder including a housing having a screw channel formed along the longitudinal axis of the housing;

at least one screw-type element rotatably received within the screw channel to convey and mix ingredients;

a feed port means arranged in the housing adjacent the upstream end thereof to input ingredients into the screw channel for conveyance and mixing by the screw-type element;

means for inputting at least certain ingredients of a cookie-like dough formulation, including oil and flour, with less than a preselected total water content, by weight, of the ingredients;

the means for inputting being coupled to the feed port means;

a vigorous mixing zone formed by the screw and screw-type element downstream from the feed port means to vigorously mix and convey the ingredients input into the feed port means;

a temperature control means operating to elevate the temperature of the screw channel for heat treatment of the ingredients input into the feed port means in a heat treatment zone of the housing extending downstream from the feed port means;

a second stage mixing apparatus including an inlet port coupled to the downstream end of the extruder housing to receive, mix and convey the heat treated ingredients conveyed through the extruder;

an added water inlet port arranged in the second stage mixing apparatus;

a source of water coupled to the added water inlet port to add a preselected amount of water through the added water inlet port to increase the water content and modify the consistency of the heat treated ingredients from the extruder input into the inlet port of the second stage mixing apparatus;

a mixing zone formed by the second stage mixing apparatus and operating to mix the added water throughout the heat treated ingredients under pressure and temperature conditions to avoid substantial oil separation from the heat treated ingredients and added water; and

an output means at the downstream most end of the second stage mixing apparatus.

4,960,044

APPARATUS FOR PREPARING A CURD MASS

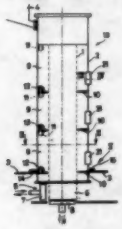
Everardus G. M. Yntema, Boisward, Netherlands, assignor to Stork Friesland B. V., Gorredijk, Netherlands

Filed Nov. 7, 1989, Ser. No. 432,561

Claims priority, application Netherlands, Nov. 8, 1988, 8802738

Int. Cl.[5] A01J *25/11*

U.S. Cl. 99—458 5 Claims



1. An apparatus for preparing a curd mass by draining whey from a mixture of whey and curds comprising an upright column consisting of at least one whey permeable sleeve of circular or rectangular cross section that has an upper end and a lower end, said sleeve or sleeves being surrounded by a tube having a wall and an outside and an inside, said tube mounted on a worktable with the inside in spaced relation to said sleeve or sleeves to create a free space between the sleeve or sleeves and the tube, a feed means at the upper end of the sleeve means for feeding the mixture of whey and curds into the sleeve or sleeves and a discharge means at the lower end of the sleeve for receiving and discharging a drained and extruded curd mass, dividers mounted in the free space between the sleeve or sleeves and the tube to subdivide the free space into several compartments lying one above the other, each compartment having an inlet and an outlet connection for conveying whey or cleaning liquid, the sleeve means being connected to the tube and to the dividers to form a fixed assembly, and fastening means for fastening the fixed assembly on the worktable.

4,960,045

ARRANGEMENT FOR THE COMPRESSING OF REFUSE

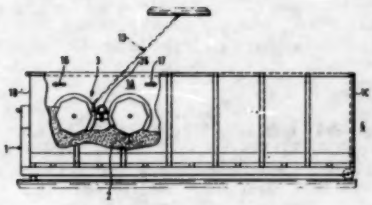
Henry Hansen, Hajvägen 19, S-432 03, Träslövsläge, Sweden

Continuation of Ser. No. 221,784, Aug. 10, 1988, abandoned. This application Nov. 27, 1989, Ser. No. 443,050

Claims priority, application Sweden, Jan. 23, 1986, 8600296-1

Int. Cl.[5] B30B *15/26, 3/02*

U.S. Cl. 100—43 7 Claims



1. An arrangement for compressing refuse material by means of roller-shaped compressing bodies acting in a refuse container and moving along back and forth in the container so as to compress the material, comprising a pair of compressing bodies, each body having a pair of adjoining core members rotatably mounted on a central member, a gear box disposed inside said central member, a motor mounted in one of said core members and connected to said gear box, a drive means interconnecting between said gear box and said core members for rotating said core members, cutting means secured to peripheral surfaces of said core members, a connecting tube extending transversely from each central member, means for coupling free ends of said connecting tubes to provide a tandem cooperative compressing unit, electric control means located exteriorly of the refuse container, a cable connecting said electric control means to the motors in said unit for providing energy and information to operate the unit for a free movement for a predetermined period and to reverse a drive direction after a further predetermined period has elapsed.

4,960,046

CALENDER ARRANGEMENT

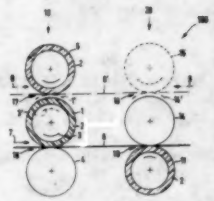
Helmut Anstötz, Tönisvorst, and Egon Brink, Kempen, both of Fed. Rep. of Germany, assignors to Eduard Küsters Maschinenfabrik GmbH & Co KG, Krefeld, Fed. Rep. of Germany

Filed Jun. 22, 1989, Ser. No. 370,243

Claims priority, application Fed. Rep. of Germany, Jun. 22, 1988, 3821027

Int. Cl.[5] B30B *3/04, 15/34*

U.S. Cl. 100—93 RP 12 Claims



1. A calender arrangement having a plurality of hard and soft rolls, supported to be positioned against each other and separated from each other while forming different nips, through which a paper web can be guided on a number of different paths, comprising:

first and second successive stacks of rolls following each other in the direction of travel of the paper web;

said first stack of rolls including a soft center roll with bending control, the effective direction of which can be changed by 180°, a soft roll supported on one side of said soft center roll for interaction with said soft center roll, when one effective direction is selected and a first heated hard roll arranged on the opposite side of said soft center roll and supported for interaction with said soft center roll when its effective direction is changed by 180°, said heated hard roll thereby contacting one side of the paper web; and

said second stack of rolls including at least one pair of rolls comprising a soft roll with bending control and second heated hard roll disposed such as to engage on the other side of the paper web.

4,960,047

TOPPING FOIL LOADING MECHANISM AND METHOD

Robert W. Lundstrom, Plymouth, and Robert A. Sella, Minneapolis, both of Minn., assignors to DataCard Corporation, Minneapolis, Minn.

Filed Nov. 23, 1988, Ser. No. 276,380

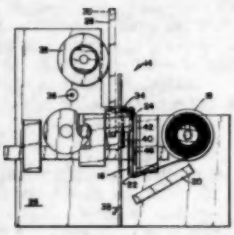
Int. Cl.[5] B44C *1/14*

U.S. Cl. 101—27 25 Claims

21. A method for advancing an end of a reel of foil material into a threadable mechanism along a foil material flow path with a foil lift arm, comprising the steps of:

(a) advancing an end of a length of the foil material so that sufficient length of foil material hangs over the lift arm

and engages the lift arm so that the weight of the foil material acts to counterbalance the resistance of the foil material attached to the supply reel and the foil material will not fall off the lift arm upon raising the lift arm from a lower position to an upper position;



(b) raising the lift arm so that the lift arm engages the underside of the foil material and lifts the foil material to a higher position wherein the foil material may be accessed; and

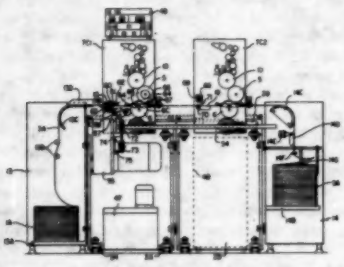
(c) feeding the end of the foil material through the remainder of the foil material flow path.

4,960,048

MULTI-COLOR VARIABLE FORMAT OFFSET PRINTING PRESS

Jean L. Sarda, 48, Avenue Claude Vellefaux, Paris, France (75010)

Filed Jul. 6, 1989, Ser. No. 376,242
Claims priority, application France, Jul. 7, 1988, 88 09243
Int. Cl.[5] B41F *5/16*
U.S. Cl. 101—182 **5 Claims**



1. In a multi-color offset printing press for variable formats for a printing continuous web selectively with and without 'Caroll' type perforations, the printing press having a plurality of printing units, the improvement comprising in combination:

a blanket bearing cylinder;

a plate bearing cylinder;

a pressure cylinder;

mounting means for mounting the plate bearing cylinder in rotating contact with the blanket bearing cylinder and the blanket bearing cylinder in rotating contact with the pressure cylinder, with the web being drawn between the pressure cylinder and the blanket bearing cylinder;

means for causing the blanket bearing cylinder to exert pressure against the plate bearing cylinder and the pressure cylinder;

means for releasing the pressure exerted by the blanket bearing cylinder at the end of the format and on at least one printing cycle out of two; and

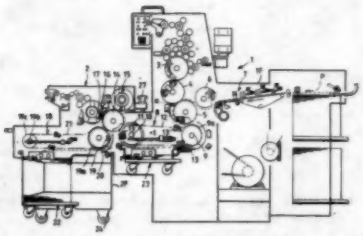
means for driving the web and for stopping forward movement of the web when the pressure is released by the blanket bearing cylinder, to allow the web to be positioned correctly before the following printing cycle.

4,960,049

OFFSET PRINTING MACHINE HAVING TWO PRINTING UNITS

Takashi Mimura, and Nobuhiko Fujisawa, both of Fuchu, Japan, assignors to Ryobi Ltd., Hiroshima, Japan

Filed Jul. 12, 1989, Ser. No. 378,875
Int. Cl.[5] B41F *5/22*
U.S. Cl. 101—217 **11 Claims**



1. An offset printing machine having two printing units comprising:

a first printing unit comprising a front frame (25), a rear frame (25'), a first impression cylinder (5), and a first chain delivery unit (8) having an endless chain (12) and a driven shaft (10) rotatably supported by the front and rear frames (25 25');

a second printing unit comprising a second front frame (26), a second rear frame (26'), and a second impression cylinder (14);

a tension control means for controlling tension of the endless chain (12), the tension control means comprising a pair of first and second bearing holders (28 29) for supporting the driven shaft (10) and movable relative to the front and rear frames (25 25') in a tension controlling direction; a linking holder (30) provided integral with the first bearing holder (28), and a pivot holder (31) provided integral with the second bearing holder (29);

means for pivoting the second printing unit (2), the pivoting means comprising the pivot holder (31), a first holder (45) fixed to the second rear frame (26'), a pivot bolt (27) supported on the first holder (45) and engageable with the pivot holder (31); and

means for connecting the second unit (2) to the first unit (1), the connecting means comprising the linking holder (30), a second holder (42) fixed to the second front frame (26) end a linking pin (44) supported by the second holder (42) and engageable with the linking holder (30).

4,960,050

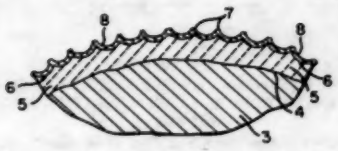
LIQUID TRANSFER ARTICLE HAVING A VAPOR DEPOSITED PROTECTIVE PARYLENE FILM

Russell B. Hatch, Swindon, England, assignor to Union Carbide Coatings Service Technology Corp., Danbury, Conn.

Filed Jul. 7, 1989, Ser. No. 376,524
Int. Cl.[5] B41F *31/26*
U.S. Cl. 101—348 **9 Claims**

1. A liquid transfer article for use in transferring a metered quantity of a liquid to another surface comprising a substrate coated with a material selected from the group consisting of ceramics, and metallic carbides; a pattern of wells engraved in said coating with each of said wells having a surface adapted for receiving a metered quantity of a liquid; and wherein any

microporosities in the surface of the wells are filled with vapor-deposited parylene and wherein the surface of the wells



has a vapor-deposited film of parylene from 0.1 to 3 microns thick.

4,960,051

INK FEEDER DRIVER FOR ROTARY PRESS

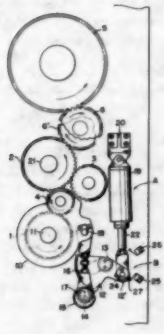
Hideo Obta, Tokyo, and Haruyoshi Kobayashi, Yokohama, both of Japan, assignors to Kabushiki Kaisha Tokyo Kikai Seisakusho, Tokyo, Japan

Continuation of Ser. No. 190,850, May 6, 1988, abandoned. This application Jun. 12, 1989, Ser. No. 366,209

Claims priority, application Japan, May 7, 1987, 62-109852

Int. Cl.[5] B41F *31/10*; B41L *27/00*

U.S. Cl. 101—349 **7 Claims**



1. An ink feeder driver for a rotary press having a printing cylinder (5) rotatable in either of two directions and an ink cylinder required to be rotated only in a predetermined direction, means for driving said pringing cylinder in either of two rotational directions, means for drivingly connecting said printing cylinder with said ink cylinder and for rotating said ink cylinder in a predetermined single rotational direction irrespective of the direction of rotation of said printing cylinder comprising:

a first gear (1) connected to said ink cylinder and rotating about an axis (11) in a direction matched to the direction of rotation of said ink cylinder;

a second gear (2) rotating about an axis (21) fixedly disposed with respect to said first gear and connected to said printing cylinder (5) to rotate in the same direction thereof;

a first idle gear (3) fixedly positioned and at all times meshed with said second gear (2);

a second at least one idle gear (4,4') meshed at all times with said first gear (1) and engagable with one of said second gear (2) and said first idle gear (3);

a displacing means (10) rotatable about an axis (11 or 21) and carrying said second at least one idle gear (4,4') rotationally thereon; and

means (19) for rotating said displacing means (10) about its axis (11 or 21) so as to selectively move said second at least one idle gear (4,4') between a first position wherein it is in mesh with said second gear (2) and a second position wherein it is in mesh with said first idle gear (3).

4,960,052

FILM INKING APPARATUS FOR A PRINTING PRESS

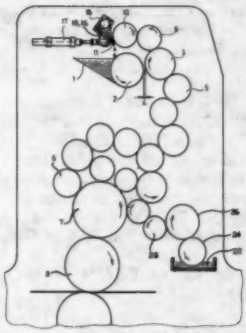
Rudi Junghans, Wilhelmsfeld, Fed. Rep. of Germany, assignor to Heidelberger Druckmaschinen Aktiengesellschaft, Heidelberg, Fed. Rep. of Germany

Filed Feb. 8, 1989, Ser. No. 308,434

Claims priority, application Fed. Rep. of Germany, Feb. 11, 1988, 3804204

Int. Cl.[5] B41F *31/06, 31/04*; B41L *27/12*

U.S. Cl. 101—350 **20 Claims**



1. An inking apparatus for a printing press, said printing press comprising an ink reservoir and a plate cylinder, said inking apparatus being operable to transfer ink from said ink reservoir to said plate cylinder, said inking apparatus comprising:

ink transfer means for transferring ink to said plate cylinder, said ink transfer means comprising at least four inking unit rollers;

ink fountain roller means for receiving ink from said ink reservoir and transporting said ink on its surface;

film roller means for receiving a quantity of ink from said ink fountain roller means, for transporting said received quantity of ink on its surface, and for transferring at least a portion of said quantity of ink received from said ink fountain roller means to said ink transfer means;

said film roller means being positioned adjacent said ink fountain roller means and spaced therefrom by a gap;

means for rotating said ink fountain roller means at a rotational speed;

means for rotating said film roller means at a substantially greater rotational speed than the rotational speed of said ink fountain roller means;

at least one intermediate roller means for receiving a quantity of ink from said film roller means and for transporting said quantity of ink received from said film roller means;

said at least one intermediate roller means being in substantially constant contact with said film roller means at a point of contact therebetween;

means for rotating said at least one intermediate roller means and said film roller means in the same tangential direction and at the same tangential speed at said point of contact between said at least one intermediate roller means and said film roller means;

doctor roller means for receiving a quantity of ink from said at least one intermediate roller means and for transporting said quantity of ink received from said at least one intermediate roller means on its surface;

both of said doctor roller means and said at least one inter-

mediate roller means being outboard of said ink transfer means;

said doctor roller means being in substantially constant contact with said at least one intermediate roller means at a point of contact therebetween;

means for rotating said doctor roller means and said at least one intermediate roller means in the same tangential direction and at the same tangential speed at said point of contact between said doctor roller means and said at least one intermediate roller means; and

removal means for removing, from said surface of said doctor roller means, at least a portion of said quantity of ink received from said at least one intermediate roller means and for returning said removed quantity of ink to said ink reservoir;

said removal means comprising a doctor blade, said doctor blade extending across substantially the entire width of said doctor roller means.

4,960,053

VIBRATOR CONTROL FOR INKING UNITS OF PRINTING PRESSES

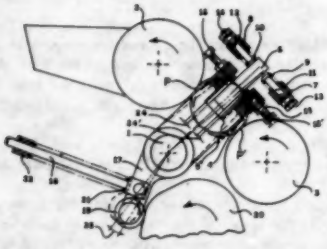
Peter Hummel, Offenbach am Main, and Roland Höll, Weiterstadt, both of Fed. Rep. of Germany, assignors to Man Roland Druckmaschinen AG, Fed. Rep. of Germany

Filed Oct. 26, 1989, Ser. No. 427,584

Claims priority, application Fed. Rep. of Germany, Oct. 27, 1988, 3836580

Int. Cl.[5] B41F *31/14, 31/30*

U.S. Cl. 101—350 2 Claims



1. A vibrator control for inking units of printing presses, having side frames, an ink ductor roller and an ink distributing roller between which a vibrator roller can be moved into and out of engagement in oscillating fashion, the control comprising in combination,

a control shaft rotatably mounted in the press side frames for oscillating movement,

drive means including a rotating cam, a cam follower and a cam follower lever for oscillating the control shaft,

means including a pair of rocking levers journalled on the control shaft for supporting the vibrator roller,

a pair of forked levers rigidly secured to the control shaft for oscillation therewith,

means including resilient abutments mounted on the press side frames and disposed on opposite sides of each rocking lever for opposing the oscillating movement thereof, each of the resilient abutments including a contact pin and means for adjusting the contact pin in order to engage the rocking lever only halfway through the operative movement produced by the drive means,

means including opposed adjusting screws carried by the forked levers for operatively connecting the forked levers and the rocking levers, the adjusting screws being disposed and adjusted so that when the vibrator roller alternately contacts the ductor roller along contact line P and the spreader roller along contact line P', a gap is opened alternately between the rocking lever and the contact pin on the opposite side.

4,960,054

OFFSET PRINTING BY REPEATEDLY INKING BLANKET BEFORE CONTACT WITH STOCK MATERIAL

Paul Pfau, Mühlheim/Ruhr, Fed. Rep. of Germany, assignor to Paul Pfau GmbH & Co. KG

Filed Jul. 27, 1989, Ser. No. 386,908

Claims priority, application Fed. Rep. of Germany, Jul. 27, 1988, 3825480

Int. Cl.[5] B41M *1/06, 1/18*

U.S. Cl. 101—451 8 Claims

1. In a process for the offset printing of stock material, the process including damping a printing forme and inking the printing forme with printing ink, subsequently transferring the image from the inked forme to a blanket and then from the blanket to the stock material, the improvement comprising inking the blanket repeatedly with the printing ink so as to produce an image having an elevated ink layer thickness on the blanket, subsequently transferring the image in a single printing step from the blanket to the stock material and, before the transfer of the printing ink or image to the stock material, removing moisture or water present on the blanket, and finally printing a non-hygroscopic stock material.

4,960,055

PROJECTILE COMPRISING SUB-PROJECTILES WITH A PRE-DEFINED ZONE OF EFFECTIVENESS

Gérard Dieval, Neuilly, France, assignor to Thomson-Brandt Armements, Boulogne-Billancourt, France

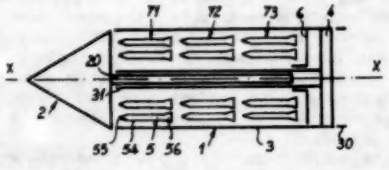
Filed Dec. 29, 1987, Ser. No. 139,315

Claims priority, application France, Dec. 31, 1986, 86 18423

The portion of the term of this patent subsequent to Oct. 18, 2005, has been disclaimed.

Int. Cl.[5] F42B *13/50*

U.S. Cl. 102—489 3 Claims



1. A projectile containing sub-munitions in a sub-munitions loading space, said projectile comprising:

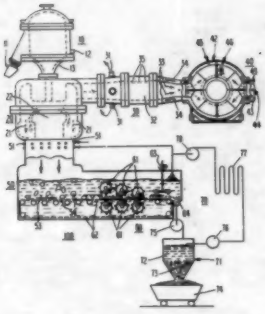
means for determining a predetermined trajectory for said sub-munitions subsequent to ejection, said trajectory of said ejected profile forming a first angle with the ground on which is located a predetermined zone of effectiveness, and wherein the shape of the cross-section of said sub-munitions loading space is a function of the geometry of said predetermined zone of effectiveness and said angle between the trajectory of the main projectile and said ground and wherein said shape of the cross-section of said sub-munitions loading space is substantially homothetical with said shape of said predetermined zone of effectiveness.

4,960,056

SLAG PROCESSING SYSTEM FOR DIRECT COAL-FIRED GAS TURBINES

Paul W. Pillsbury, Winter Springs, Fla., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Sep. 8, 1989, Ser. No. 404,396
Int. Cl.[5] F23B 7/00
U.S. Cl. 110—233 21 Claims



1. In a direct coal-fired gas turbine system of the type having a primary combustion compartment coupled to an impact separator for removing molten slag from hot combustion gases, said hot combustion gases ducted to an expander section of said gas turbine, the improvement comprising:

(a) quenching means for solidifying said molten slag removed by said impact separator; and

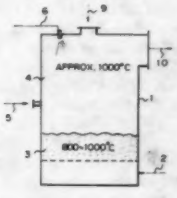
(b) processing means for forming a slurry from said solidified slag for facilitating removal of said solidified slag from said system.

4,960,057

METHOD OF INCINERATING COMBUSTIBLES BY USING FLUIDIZED BED

Takahiro Ohshita; Tsutomu Higo, and Yukio Mizoguchi, all of Kanagawa, Japan, assignors to Ebara Corporation, Tokyo, Japan

PCT No. PCT/JP87/00095, § 371 Date Aug. 5, 1988, § 102(e) Date Aug. 5, 1988, PCT Pub. No. WO87/05089, PCT Pub. Date Aug. 27, 1987
PCT Filed Feb. 13, 1987, Ser. No. 265,849
Claims priority, application Japan, Feb. 14, 1986, 61-28777; Mar. 11, 1986, 61-51551; May 23, 1986, 61-117507; Jun. 24, 1986, 61-146006
Int. Cl.[5] F23G 5/30, 7/00
U.S. Cl. 110—345 8 Claims



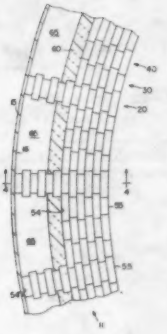
1. A method of incinerating combustibles characterized in that several kinds of combustibles are incinerated in a fluidized bed type incinerator using a granular material and/or granular sintered material as a primary fluidizing medium, said granular material and/or granular sintered material comprising at least 85% TiO_2 as its primary component.

4,960,058

SELF-POSITIONING REFRACTORY STRUCTURE

William R. Materna, Dubuque, Iowa, assignor to Merkle Engineers, Inc., Galena, Ill.

Filed Oct. 26, 1989, Ser. No. 427,044
Int. Cl.[5] F23M 5/00
U.S. Cl. 110—336 33 Claims



1. In a furnace having a generally circular cross section, a self-positioning refractory structure comprising:

a generally cylindrical casing;

a plurality of positioning refractories each having straight interlocking means, a plurality of filler refractories each having said straight interlocking means, and a plurality of wedge refractories each having wedge interlocking means, arranged to form a cross-sectionally curved structure within said cylindrical casing;

said positioning refractories, said filler refractories and said wedge refractories interlocked by said straight interlocking means and said wedge interlocking means forming the self-positioning refractory structure; and

a positioning length of each said positioning refractory being greater than a filler length of each said filler refractory and being greater than a wedge length of each said wedge refractory, each said positioning refractory having a cold end in positioning contact with an inside wall of said casing and a hot end directed toward a center of the self-positioning refractory structure.

4,960,059

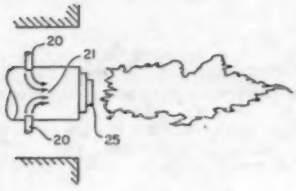
LOW NOX BURNER OPERATIONS WITH NATURAL GAS COFIRING

Eugene Berkau, Brentwood, Tenn.; Bernard Breen, Laguna Beach, Calif.; James E. Gabrielson, Plymouth, Minn., and Steve Winberg, Pittsburgh, Pa., assignors to Consolidated Natural Gas Service Company, Inc., Pittsburgh, Pa.

Filed Jun. 26, 1989, Ser. No. 371,059
Int. Cl.[5] F23D 1/00
U.S. Cl. 110—347 41 Claims

1. An improved combustion method for reducing NOx emissions from a coal burner of the type where pulverized coal is injected into a combustion zone, wherein the improvement comprises the addition of at least one flammable fuel, other than coal, the addition being from 2% to 25% of the total

energy input into the combustion zone, wherein the addition provides at least one of NOx reduction, stable ignition, prevention of flame lift-off, elimination of rumble, recovery of lost load and reduction of slagging, fouling and corrosion.



4,960,060

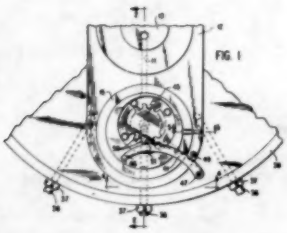
FERTILIZER INJECTOR

Lyle E. Overocker, R.R. 1, Milford, Iowa 51351

Filed Sep. 15, 1989, Ser. No. 408,198

Int. Cl.[5] A01C *23/04*; F16K *29/00, 5/14*

U.S. Cl. 111—128 **8 Claims**



1. In a device for injecting a fluid into the earth including a rotor and a stator, said stator including a fixed axle, a stator plate fixed to said axle and housing means on said stator plate, said rotor including a rotor plate rotatably mounted on said axle injector means mounted on said rotor plate, drum means attachable to said rotor plate and cover means for said drum means, said rotor and said stator both being formed to provide passageways and ducts to conduct said fluid through said stator and to said injector means, the improvement which comprises a mounting means on said stator, seal means rotatably mounted in said housing, said seal means being formed to provide a passage for said fluid from said stator to said, rotor and being in slidable contact with said rotor plate, and operating means engageable between said rotor and said seal means to require said seal means to be rotated positively relative to the housing.

4,960,061

EMBROIDERING MACHINE

Ikuo Tajima, and Hideo Hasegawa, both of Kasugai, Japan, assignors to Tokai Kogyo Mishin Kabushiki Kaisha, Kasugai, Japan

Filed Jun. 28, 1988, Ser. No. 212,701

Claims priority, application Japan, Jun. 29, 1987, 62-159880; Feb. 17, 1988, 63-32825

Int. Cl.[5] D05B *21/00*

U.S. Cl. 112—103 **14 Claims**

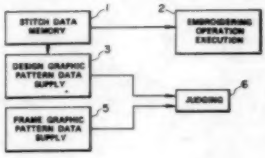
8. An embroidering machine comprising:

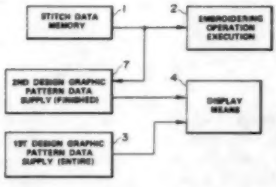
stitch data memory means storing stitch data representing each individual stitch for realizing an embroidering operation corresponding to a desired embroidery design;

means for reading out the stitch data from the stitch data memory means and executing the embroidering operation in accordance with the read out stitch data;

graphic pattern data supply means for supplying, in correspondence to an embroidery design stored in said stitch data memory means, graphic pattern data of the pattern of the embroidery design;

display means for displaying the embroidery design pattern in accordance with the graphic pattern data supplied by the graphic pattern data supply means;





frame graphic pattern data supply means for supplying frame graphic pattern data for graphically displaying the shape of an embroidery frame; and

judging means for comparing the graphic pattern data of the embroidery design supplied by said graphic pattern data supply means and the frame graphic pattern data supplied by said frame graphic data supply means so as to judge whether or not the embroidery design pattern fits in the embroidery frame.

4,960,062

SEWING MACHINE AUTOMATIC THREAD TENSION DEVICE WITH THREAD ELONGATION DETECTOR

Susumu Hanyu; Noboru Kasuga; Kazumasa Hara; Mikio Koike, and Mitsuru Ninijima, all of Tokyo, Japan, assignors to Janome Sewing Machine Co. Ltd., Tokyo, Japan

Filed Jun. 27, 1988, Ser. No. 211,694

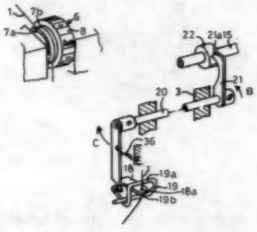
Claims priority, application Japan, Jul. 3, 1987, 62-165224

Int. Cl.[5] D05B *47/04*

U.S. Cl. 112—255 **3 Claims**

1. A sewing machine comprising a needle holding an upper thread; a drive shaft rotatable to vertically reciprocate the needle holding an upper thread; means for carrying a lower thread and catching the upper thread to form lock stitches in cooperation with the needle; a source of the upper thread; a main thread take-up lever operated in synchronism with the needle to tighten and slacken the upper thread; a presser bar having a presser foot mounted at a lower end thereof and

vertically shiftable to a variable position depending upon a thickness of a fabric to be sewn; an upper thread tension member arranged in an upper thread running path between said upper thread source and said main thread take-up lever; an auxiliary thread take-up lever arranged in the upper thread running path between said main thread take-up lever and said needle and having a thread engaging part for guiding the upper thread; a thread presser arranged laterally of the upper thread running path between said main and auxiliary thread take-up levers and normally clamping the upper thread; means for detecting a predetermined rotation phase of said drive shaft and producing an electric signal; control means responsive to the electric signal of said detecting means to cause said thread presser to release the upper thread; thread elongation detecting



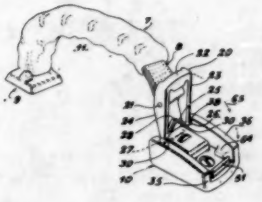
means arranged in the upper thread running path between said main and auxiliary thread take-up levers and generating an electric signal in response to an elongation of the upper thread caused by said main thread take-up lever during sewing operation, said control means determining the duration in which said thread presser releases the upper thread in response to the electric signal of said thread elongation detecting means; a thread guide fixedly arranged adjacent to said auxiliary thread take-up lever, said auxiliary thread take-up lever being controlled in association with said drive shaft for movement relative to said thread guide into a position in which said thread engaging part cooperates with said thread guide to absorb a slack amount of the upper thread in said thread running path between said main thread take-up lever and said needle while said thread presser releases the upper thread.

4,960,063

SAFETY DEVICE FOR THE FOOT-HOLDER OF A SAIL BOARD OR THE LIKE

Daniel Bostemps, Nevers, France, assignor to STE Look, Nevers, France

Filed Aug. 8, 1988, Ser. No. 229,468
Claims priority, application France, Aug. 28, 1987, 87 12067
Int. Cl.[5] B63H 9/04
U.S. Cl. 114—39.2 **13 Claims**



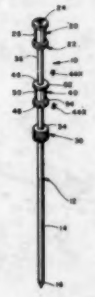
1. A safety device for the foot-holder of a sailboard or the like in which said foot-holder has a strap in the form of a loop fixed at one end on the sailboard, wherein the other end of the strap is secured to a latch which can be engaged in a locking body with a first elasticity in a first predetermined direction and then locked in said locking body with a second elasticity in a second direction perpendicular to the first predetermined direction, said latch and locking body being so arranged that under the action of a pulling stress exerted on the latch in the second direction, said latch is unlocked in a direction to enlarge said loop while remaining engaged in the locking body and that under the action of a shearing stress exerted on the latch in the first direction, said latch is released from the locking body and opens the hoop.

4,960,064

LAND ANCHOR FOR A BOAT

Gilbert L. Mestas, and Joseph G. Mestas, Jr., both of 606 E. 5th St., Pueblo, Colo. 81001

Filed Oct. 17, 1989, Ser. No. 422,419
Int. Cl.[5] E21B 11/02
U.S. Cl. 114—230 **3 Claims**



1. A land anchor for a boat comprising:

A) an elongated hollow rod having a point on one end and an external threaded portion adjacent to a second end, and a cylindrical wall having an outer surface connecting said point to said second end;

B) a handle threadably fixed to said rod on said rod second end, said handle having an annular abutting surface located in surrounding relationship with said rod threaded portion and a top end;

C) a rope engaging element fixedly mounted on said rod at a location spaced from said handle, said rope engaging element being cylindrical and including

(1) a plurality of rope receiving circular grooves defined in the outer surface of said rope engaging element,

(2) an annular abutting surface which is located in surrounding relationship with said rod and which is spaced from said handle abutting surface along the longitudinal direction of said rod to define a hammering gap, said handle abutting surface and said rope engaging element abutting surface being in confronting relationship with each other;

D) a cylindrical hammer element slidably mounted on said rod between said handle and said rope engaging element abutting surfaces to move in said hammering gap and including

(1) an annular handle impacting surface which is in surrounding relationship with said rod and in confronting relationship with said handle abutting surface to contact said handle abutting surface when said hammer element is slidably moved into a first position,

(2) an annular rope engaging element abutting surface which is in surrounding relationship with said rod and in confronting relationship with said rope engaging element abutting surface to contact said rope engaging element abutting surface when said hammer element is slidably moved to a second position, and

(3) a gripping surface between said handle impacting

surface and said rope engaging element impacting surface; and

E) an anchor stabilizing assembly which includes

(1) a wing section in said rod near said rod point, said wing section being flush with said rod wall outer surface in a ground inserting position of said stabilizing assembly and extending outwardly from said wall outer surface in a ground gripping position of said stabilizing assembly, and

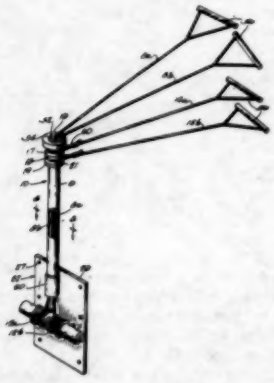
(2) moving means on said rod and connected to said wing section for moving said wing section between said ground inserting position and said ground gripping position.

4,960,065

WATER SKI TOW ROPE APPARATUS

Edmund Junkeris, 917 Powder Horn Rd., Sun Prairie, Wis. 53590

Filed Nov. 18, 1988, Ser. No. 273,211
Int. Cl.[5] B63B *21/16*
U.S. Cl. 114—254 **7 Claims**



1. An apparatus for holding and deploying tow ropes from a boat, comprising:

a tow bar having at least one channel therethrough for axially receiving a tow rope interiorly thereof;

a first flange mounted on one end of said tow bar, said flange having a curved surface forming an entrance to said channel in said tow bar;

a second flange mounted on said tow bar in a spaced relation to said first flange mounted on one end of said tow bar to form a first groove for an abaxially mounted tow rope;

supporting means for supporting said tow bar in the boat; and

securing means mounted on said supporting means for securing the tow rope to the boat.

4,960,066

BOW COVER

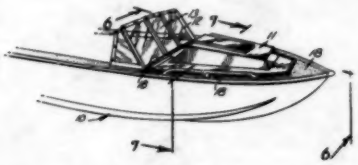
James W. Wills, 895 90th Avenue, NW., Coon Rapids, Minn. 55433

Continuation-in-part of Ser. No. 272,500, Nov. 17, 1988, Pat. No. 4,922,849. This application Jun. 22, 1989, Ser. No. 369,840
Int. Cl.[5] B63B *17/00*
U.S. Cl. 114—361 **2 Claims**

1. A bow cover for covering an open region within the hull of a boat at its bow which boat has a divider means supported by said hull separating its bow portion from remaining portions of said boat with a passageway therethrough such that said bow portion of said boat is accessible from said remaining portions thereof through said pasageway, and where said open region in said bow portion has about a substantial part of its periphery, excluding at least that at said passageway, a rim means supported in said boat such that said rim means has a surface thereof exposed, said bow cover comprising:

a shell means having an inwardly directed opening extending substantially inward therein and having an outer edge substantially all of which is capable of being placed adjacent to said exposed surface of said rim means excluding at said passageway where said inwardly directed opening would be located;

an access means fastenable to said shell means at a point substantially interior to said outer edge thereof such that it can cover said inwardly directed opening and can extend past said shell means such that if said outer edge of said shell means is placed adjacent to said exposed surface of



said rim means with said inwardly directed opening aligned with said passageway, as aforesaid, said access means can extend over said passageway;

attachment means connected to said shell means at said interior surface thereof and capable of forming at least a portion of an attachment device;

wherein said access means has a first part rotatably fastened to said interior portion of said shell means adjacent said inwardly directed opening, and a second part which is rotatably connected to said first part;

wherein said access means has a third part separable from said second part, said third part being capable of extending across said passageway to block ingress and egress from said bow portion; and

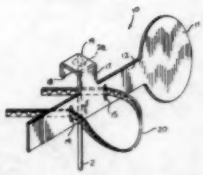
wherein said access means third part has at least a portion of a locking means mounted thereon.

4,960,067

ANTENNA SIGNAL DEVICE

Aaron D. Currie, Rte. 4, Box 491-H Fulton Ct., Concord, N.C. 28025

Filed Dec. 18, 1989, Ser. No. 451,630
Int. Cl.[5] G09F *17/00*
U.S. Cl. 116—28 R **4 Claims**



1. An antenna signal device for securement to an automotive antenna, wherein the antenna includes an upper end, and wherein the device comprises,

a signal plate integrally formed to an elongate body member, wherein the signal plate is in planar alignment relative to the body member, and

the body member including a top edge, a bottom edge, and an end edge, and

a tab means integrally mounted medially of the top edge and

extending orthogonally thereto for overlying securement to the upper end of the antenna, and

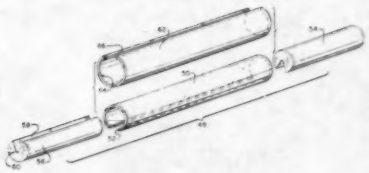
securement means cooperative with the body member to secure the body member to the antenna, wherein the tab means is formed as a "U" shaped member, with a first leg integrally mounted to the top edge of the body member spaced from and parallel to a second leg, wherein the first leg and second leg are joined by a third leg, wherein the third leg is formed orthogonally relative to the first leg and second leg, and the securement means includes a securement line, and the securement means further includes a first slot and a second slot, the first slot and second slot are aligned parallel to one another and spaced on each side of the first leg in orthogonal alignment relative to the top edge of the body member, with the securement line extending through the first slot and second slot for securement about the antenna.

4,960,068

FIBER GAUGING GUIDE FOR AN IN-LINE OPTICAL FIBER ADHESIVE APPLICATOR

Daniel K. Schotter, Tucson, Ariz., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Aug. 22, 1989, Ser. No. 396,710
Int. Cl.[5] B05C *11/02*
U.S. Cl. 118—123 **12 Claims**



1. Apparatus for gauging the thickness of an adhesive material adhered to an optical fiber and guiding the fiber, comprising:

a hollow cylindrical tube including a bore of uniform diameter and a single slot extending longitudinally completely along one side;

a hollow cylindrical housing with a slot along one side, said housing being so dimensioned as to enable sliding receipt within the tube bore;

first and second roller guides, each having cross-sectioned dimensions enabling sliding receipt within the housing and a V-shaped slot extending completely along one side;

said first and second roller guides being located within the tube in end-to-end relation with the V-shaped grooves of each facing generally in opposite directions for slidingly receiving the fiber and adhesive thereon within the grooves, and said housing with roller guides being located within the tube.

4,960,069

MAGNETIC BRUSH DEVELOPING DEVICE

Shozo Kaieda, Nagano, Japan, assignor to Kentek Information Systems, Inc., Allendale, N.J.

Filed Mar. 17, 1989, Ser. No. 324,914
Int. Cl.[5] G03G *15/09*
U.S. Cl. 118—657 **15 Claims**

1. A magnetic brush developing device for an electrophotographic printing machine, comprising

a developing roller forming a magnetic brush,

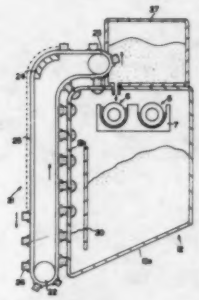
a scraper associated with said developing roller for removing residual developer from said developing roller,

a developer housing,

a developer tank for accommodating recycled developer therein, said developer tank being disposed outside said developer housing,

first developer carrier means disposed within said developer housing opposite to said developing roller for carrying developer along its entire length, for supplying developer to said developing roller during said carrying operation, and for delivering excess toner to said developer tank through an opening in said developer housing,

second developer carrying means disposed within said developer housing parallel to said first developer carrying



means and communicating with said first developer carrying means in said developer housing for carrying developer from said developer tank in a direction opposite to the carrying direction of said first developer carrying means, for recovering developer scraped from said developing roller by said scraper, and for delivering developer to said first developer carrying means, and

third developer carrying means associated with said developer tank for supplying recycled developer accommodated in said developer tank to said second developer carrying means.

4,960,070

DEVELOPING APPARATUS

Matsuomi Nishimura, Ohmiya, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

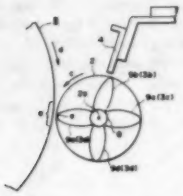
Filed Jun. 30, 1989, Ser. No. 373,580
Claims priority, application Japan, Jul. 1, 1988, 63-164140; Jul. 1, 1988, 63-164141
Int. Cl.[5] G03G *15/09*
U.S. Cl. 118—658 **18 Claims**

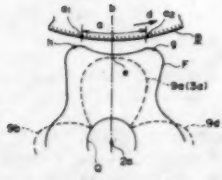
1. A developing apparatus for developing an electrostatic latent image formed on a movable image bearing member, comprising:

a rotatable developer carrying member for carrying a developer into a developing zone where an image bearing member and said developer carrying member are faced and where the electrostatic latent image on the image bearing member is developed;

a magnet stationarily disposed in said developer carrying member, wherein said magnet forms in said developing zone such a magnetic field that a peak position of a magnetic flux density of the magnetic field in a direction perpendicular to a surface of said developer carrying member is in said developing zone, and wherein a magnetic confining force in the perpendicular direction in said developing zone is so distributed that it is stronger downstream of a

position where the image bearing member and said developer carrying member are closest with respect to a move-





ment direction of the image bearing member than at the closest position.

4,960,071

THIN FILM FORMING APPARATUS

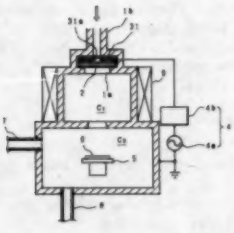
Takashi Akahori, and Satoshi Nakayama, Amagasaki, both of Japan assignors to Sumitomo Metal Industrues Ltd., Osaka, Japan

Filed Sep. 29, 1988, Ser. No. 250,745

Claims priority, application Japan, Sep. 30, 1987, 62-248911

Int. Cl.[5] C23C *16/48, 16/50*

U.S. Cl. 118—722 **11 Claims**



1. A thin film forming apparatus including a microwave generating means and in which a thin film can be formed on a specimen which has been put in a chamber of the apparatus, the apparatus having a window through which microwaves generated by the microwave generating means can be introduced into said chamber through a dielectric provided at said window so as to activate a material gas in said chamber and deposit a thin film on the specimen;

an electrode mounted on said dielectric, said electrode being provided with at least one opening therethrough through which the microwaves pass when activating the material gas in said chamber; and

a high-frequency generating source connected to said electrode.

7. A thin film forming apparatus including an electromagnetic wave generating means and in which a thin film can be formed on a specimen which has been put in a chamber of the apparatus, the apparatus having a window through which electromagnetic waves generated by the electromagnetic wave generating means can be introduced into said chamber through a dielectric provided at said window so as to activate a material gas in said chamber and deposit a thin film on the specimen;

an electrode buried in said dielectric, said electrode having at least one opening therethrough through which the electromagnetic waves pass when activating the material gas in said chamber; and

a high-frequency generating source connected to said electrode.

4,960,072

APPARATUS FOR FORMING A THIN FILM

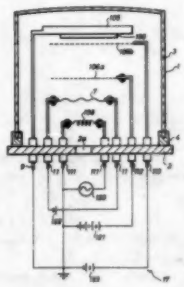
Wasaburo Ohta, Yokohama; Mikio Kinoshita, Kawasaki, and Tadao Katsuragawa, Yamato, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Aug. 5, 1988, Ser. No. 228,451

Claims priority, application Japan, Aug. 5, 1987, 62-196012; Oct. 29, 1987, 62-274442; Nov. 5, 1987, 62-169404

Int. Cl.[5] C23C *16/50*

U.S. Cl. 118—723 **13 Claims**



6. An apparatus for forming a thin film comprising:

a vacuum container evacuated to high vacuum and receiving a gas for vapor deposition therein,

generation means for generating a vapor of a material for vapor deposition and introducing said vapor into said container,

a counter electrode disposed within said container and holding a substrate to be vapor-deposited such that said substrate opposes said generation means,

a first grid disposed between said generation means and said electrode for allowing said vapor to pass therethrough and accelerating said vapor, an electrical potential of said first grid set positive relatively to an electrical potential of said electrode,

a second grid disposed between said first grid and said electrode in the vicinity of said electrode for allowing said vapor to pass therethrough and accelerating said vapor, an electrical potential of said second grid set negative relatively to said potential of said first grid, and

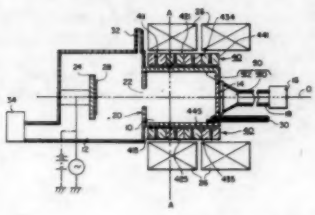
a filament disposed between said first grid and said generation means for emitting thermions to ionize said vapor.

4,960,073

MICROWAVE PLASMA TREATMENT APPARATUS

Yasuhiro Suzuki; Sumio Mori; Eiji Fujiyama, and Masami Sasaki, all of Fuchu, Japan, assignors to Anelva Corporation, Tokyo, Japan

Filed Sep. 14, 1989, Ser. No. 407,187
Claims priority, application Japan, Sep. 19, 1988, 63-234037
Int. Cl.[5] C23C *16/50*
U.S. Cl. 118—723 7 Claims



1. A microwave plasma treatment apparatus comprising:
a cylindrical plasma formation chamber,
an object treatment chamber adjoining said plasma formation chamber in the direction of the central axis thereof,
a magnetic circuit(s) provided around the periphery of said plasma formation chamber,
a plasma extracting means provided on the border between said plasma formation chamber and said object treatment chamber,
an even-numbered plurality of auxiliary magnets numbering at least two and provided around the periphery of said plasma formation chamber and on the inner side of said magnetic circuit(s), and
a microwave introducing means provided along the central axis of said plasma formation chamber and on the opposite side thereof to said object treatment chamber;
wherein the plasma formation chamber is provided with a plasma-forming gas introducing port,
wherein said object treatment chamber is provided with an object table for placing thereon an object to be treated,
wherein said auxiliary magnets are arranged symmetrically with respect to the central axis of said plasma formation chamber in such a way that the magnetic poles of every auxiliary magnet are respectively reversed in polarity relative to the adjoining magnetic poles of an auxiliary magnet adjacent thereto, and
wherein the electron cyclotron resonance phenomenon induced by an electric field formed by microwaves introduced into said plasma formation chamber through said microwave introducing means and a magnetic field formed by means of said magnetic circuit(s) and said auxiliary magnets is utilized to turn a plasma-forming gas introduced into said plasma formation chamber into a plasma, which is then extracted into said object treatment chamber through said plasma extracting means to irradiate therewith said object placed on said object table.

4,960,074

COLLAPSIBLE PORTABLE CORRAL

Robert L. Wilson, Cherokee, Okla., assignor to Wilson Mfg., Inc., Cherokee, Okla.

Filed Jun. 12, 1989, Ser. No. 364,700
Int. Cl.[5] A01K *3/00*
U.S. Cl. 119—20 59 Claims

1. A portable foldable corral for confining and directing the movement of livestock and the like comprising a front chute means for providing an exit and entrance for livestock and the like;
a first front section pivotally secured to the front chute means;
a second front section pivotally secured to the front chute means;
a first intermediate section pivotally secured to the first front section;
a second intermediate section pivotally secured to the second front section;
a first front means secured to the first front section for elevating the first intermediate section relative to the first

front section and for holding the first intermediate section in an elevated posture relative to the first front section; and
a second front means secured to the second front section for elevating the second intermediate section relative to the second front section and for holding the second intermediate section in an elevated posture relative to the second front section.

4,960,075

CAT TOY

Larry F. Klatt, 9959 Wolfe St., R.R. #2, Mission, British Columbia V2V 4H9, Canada

Filed Sep. 5, 1989, Ser. No. 408,866
Int. Cl.[5] A01K *15/00*
U.S. Cl. 119—29 3 Claims

1. A cat toy comprising:
a wooden dowel acting as a handle;
a switch member attached to the handle and comprising a single piece of a light, flexible material having a continuous central area;
a plurality of slits in the single piece of material extending outwardly from each side of the central area to the end of the piece of material, to divide the material to each side of the central area into a plurality of strips;
a ferrule crimped around the switch member with the switch member wrapped around an end of the handle to attach the switch member to the handle.

4,960,076

MECHANICAL ROPING CALF

Patrick R. Seorgrass, Tipton, and Gary K. Martin, California, both of Mo., assignors to Rope-O-Matic Systems Inc., California, Mo.

Filed Jun. 26, 1989, Ser. No. 371,068
Int. Cl.[5] A01K *15/02*
U.S. Cl. 119—29 15 Claims

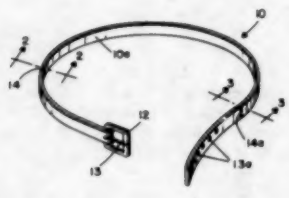
1. A mechanical roping calf assembly for use in practicing "heading" and "heeling", said assembly including a center ground supported support, a mount rotatably supported from said support for angular displacement about a vertical axis, an elongated horizontal boom, first means mounting one end of said boom from said mount for rotation therewith relative to said support, a horizontally elongated simulated standing calf body having a head end and a tail end, means mounting said simulated calf body from the other end of said boom with said boom disposed rearward toward the tail end of said calf body from the longitudinal center thereof, said head end of said calf body including a simulated calf head, said tail end of said calf body including depending leg means, said head end of said body including depending support means, ground engageable support and drive wheel means journalled from a lower portion of said support means, said boom, intermediate the opposite ends thereof and adjacent said body, including dependingly supported ground engageable support wheel means journalled therefrom for rotation about a horizontal axis generally paralleling said boom and spaced rearward of a vertical plane containing said boom, and motor means carried by said calf body assembly drivingly connected to said support and drive wheel means, the placement of said axis rearward of said vertical plane and the mounting of said boom other end to said calf body rearward of the longitudinal center of said calf body serving to increase the driving traction of said support and drive wheel means with a ground surface portion with which said support and drive wheel means is engaged.

4,960,077

ANIMAL COLLAR

Herbert Lapidus, Ridgefield, Conn., and George F. Carrier, Wayland, Mass., assignors to Combe Incorporated, White Plains, N.Y.

Filed Sep. 13, 1989, Ser. No. 406,694
Int. Cl.[5] A01K *27/00*
U.S. Cl. 119—106 4 Claims



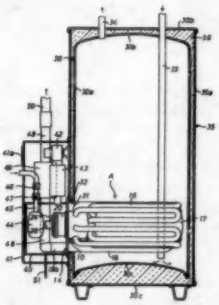
1. An animal collar for controlling fleas and ticks which is formed as an elongated strip with fastening means at the ends thereof, said strip being a plastic material with an effective amount of pesticide dispersed therethrough and having a substantial cross section with a breaking strength such that the strip cannot be broken should the animal hang by the collar, the improvement comprising: said strip having at least one break point of greatly reduced cross section to provide for a fracture of the plastic strip wherein the fracture strength at said break point is determined by a dropped weight of about 60 percent of the weight that would cause fracture in straight gently applied tension.

4,960,078

PULSE COMBUSTION DEVICE

Nobuyoshi Yokoyama, and Susumu Ejiri, both of Toyoake, Japan, assignors to Paloma Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed Nov. 9, 1989, Ser. No. 434,995
Claims priority, application Japan, Nov. 10, 1988, 63-284664
Int. Cl.[5] F22B *31/00*
U.S. Cl. 122—24 6 Claims



1. A pulse combustion device adapted for use in a liquid heating apparatus, comprising:

a combustion chamber having a forward end wall formed with an inlet port to be supplied with a mixture of gaseous fuel and air;

a radially outwardly extending attachment plate unitedly provided with the forward end wall of said combustion chamber for attachment with a liquid vessel of said heating apparatus;

a cylindrical decoupler arranged coaxially with said combustion chamber at its rear side;

a plurality of tailpipes connected at their one ends to said combustion chamber for open communication with the interior of said combustion chamber and at their other ends to a front end of said cylindrical decoupler for open communication with the interior of said decoupler, said tailpipes being arranged at their intermediate portions in parallel along the outer circumference of said cylindrical decoupler; and

an exhaust pipe connected at one end thereof to a rear portion of said decoupler and being extended forwardly along the outer circumference of said decoupler, said exhaust pipe being further extended forwardly through said attachment plate.

4,960,079

ACOUSTIC LEAK DETECTION SYSTEM

Michael L. Marziale, 1316 S. David, and Stephen J. Paradis, Rt. 2, Valley Ridge Apt. 14, both of Covington, Va. 24426

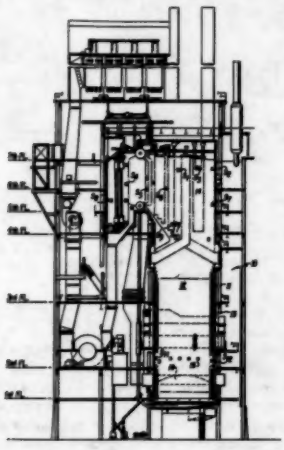
Filed Aug. 3, 1989, Ser. No. 389,327
Int. Cl.[5] F22B *37/42*
U.S. Cl. 122—504.2 7 Claims

1. A boiler fluid tube leak detection system comprising: sensor means for generating a first continuum or analog electric signals in the amplitude vs. time domain responsive to

acoustic emission from a boiler combustion space having fluid heating tubes secured therewithin;

signal converting means for converting said first continuum analog signals at rapidly repeating time intervals to a first digital data set in the amplitude vs. time domain;

data process means for processing said first digital data set from the amplitude vs. time domain to a second digital data set in the amplitude vs. frequency domain;



data analysis means for integrating at least portion of said second digital data set with respect to frequency limits to obtain a first value representative of the acoustic energy emitted from said combustion space between said frequency limits;

comparison means for comparing said first value to a set-point value; and

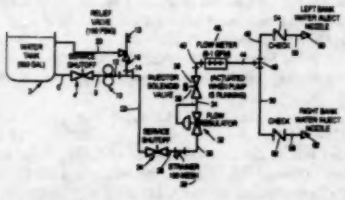
annunciation means for communicating to a human operator a quality of said comparison.

4,960,080

POLLUTION CONTROL APPARATUS AND METHOD FOR A TURBODIESEL MOTOR-GENERATOR SET

Jeff S. O'Neill; H. Edmund Schisler, and Isoroku Kubo, all of Columbus, Ind., assignors to Cummins Engine Company, Inc., Columbus, Ind.

Filed Feb. 28, 1989, Ser. No. 316,765
Int. Cl.[5] F02B *47/00*
U.S. Cl. 123—254 **11 Claims**



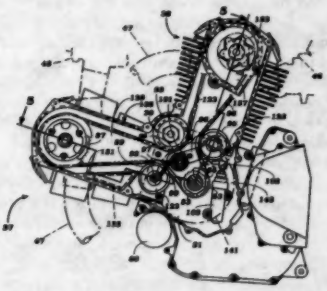
1. An emissions control system for an internal combustion engine drivingly connected to an electrical power generator having an electrical power output, said emissions control system having fluid injecting means for injecting fluids into a combustion intake air stream of said engine, having power measurement means for producing a signal in response to the electrical power output of the generator, and having control means for controlling said fluid injecting means in response to a signal produced by the power measurement means.

4,960,081

BELT DRIVEN CAMSHAFT MECHANISM FOR INTERNAL COMBUSTION ENGINE

Mamoru Atsuumi, Iwata, Japan, assignor to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

Filed Dec. 16, 1988, Ser. No. 285,781
Int. Cl.[5] F01P *1/06*
U.S. Cl. 123—41.31 **28 Claims**



1. In an internal combustion engine comprising a cylinder block having a pair of cylinder banks each defining a cylinder bore, a cylinder head for each bank for closing the respective cylinder banks of the cylinder bore, valve means in said cylinder heads for controlling flow, a piston received within said cylinder bores and driving an output shaft journaled in a crankcase positioned at the end of said cylinder bores opposite to said cylinder heads, and a toothed belt having a pair of flights each driving a respective one of said valve means from said output shaft, the improvement comprising said cylinder banks being staggered relative to each other with respect to the axis of said output shaft, a belt case having a pair of arms each enclosing at least in substantial part one of said flights of said toothed belt, means for affixing said belt case relative to said cylinder block with a face of said belt case in direct facing relation to a surface of said cylinder block, means defining an insulating layer between said belt case face and said cylinder block surface for limiting the transfer of heat from said cylinder block to said belt, said insulating layer comprising an air gap formed between each cylinder bank and the respective belt case arm, means for permitting air to flow through the interior of said belt case from an inlet drawn from the air gap between said belt case and said cylinder block, and a cooling fan driven from the valve train associated with the staggered cylinder block and positioned in the area of the stagger for circulating air through said belt case.

4,960,082

ROTARY VEE ENGINE

Robert W. Sullivan, Snyder; Tommie J. Holder, Mountain Park, and Max F. Buchanan, Roosevelt, all of Okla., assignors to Sullivan Engine Works, Inc., Snyder, Okla.

Division of Ser. No. 151,657, Feb. 3, 1988, Pat. No. 4,867,107.
This application Jun. 28, 1989, Ser. No. 373,209
Int. Cl.[5] F02B *57/06*
U.S. Cl. 123—43 A **5 Claims**

1. In a rotary vee engine:

a housing having outer ends;

two cylinder blocks each having inner and outer ends and mounted in the housing for rotation of one cylinder block about a first rotational axis and rotation of the other cylinder block about a second rotational axis, said axes being angled to intersect adjacent the inner ends of said blocks at an included angle less than one hundred and eighty degrees;

each cylinder block having a plurality of cylinders formed therein to intersect the inner end of the cylinder block and to extend therefrom into the cylinder block parallel to the rotational axis of the cylinder block;

a plurality of angled pistons each having a portion disposed in a cylinder of one block and a portion disposed in a cylinder in the other block for orbital motion of the pistons coordinately with the rotation of the cylinder blocks;

a central bore formed through each of the cylinder blocks along the rotational axis for the respective cylinder block;

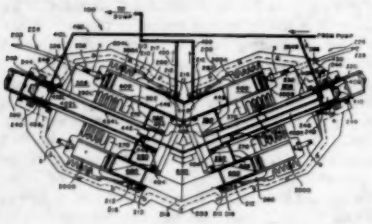
an angled support shaft assembly including a hollow drive shaft extending through the central bores of each cylinder block and fixed for rotation with the associated cylinder block and further including an angled support shaft means having a portion extending through each cylinder block within the hollow drive shaft and having end portions extending axially outwardly of the cylinder blocks;

housing bearing means rotatably supporting the support shaft assembly by the housing; and

shaft bearing means axially spaced within each hollow shaft for rotatably and axially supporting each hollow shaft and the associated cylinder block on the support shaft;

an improved oiling system which utilizes the centrifugal forces created in the operation of the engine to facilitate the distribution of lubricating oil to the major moving elements and bearing means of the engine comprising:

oil supply means pump adapted to inject a selected quantity of oil into the engine per engine revolution;



an axial oil bore provided in the angled support shaft and extending along the axis of rotation of one cylinder block and further extending at least partially along the axis of rotation of the other cylinder block;

an annular oil reservoir defined between each hollow shaft and the angled support shaft and in fluid communication with the shaft bearings;

first conduit means extending through each hollow shaft placing each housing bearing in fluid communication with the adjacent annular reservoir;

second conduit means extending through at least one hollow shaft and into the angled support shaft connecting the oil supply means in fluid communication with the axial oil bore and at least one annular oil reservoir;

oil passage means in the support shaft connecting the axial oil bore to each annular oil reservoir;

a plurality of oil inlet passage means in each cylinder block connecting the interior of each cylinder in fluid communication with the adjacent annular oil reservoir;

a plurality of oil outlet passage means in each cylinder block directing oil from each cylinder in the cylinder block; and

return conduit means extending through the housing and connecting the oil outlet passages to the oil supply means for recirculation of the oil;

whereby the improved oiling system provides lubricating oil to the bearing means and cylinders of the engine and the oil circulation is enhanced by the centrifugal forces created by engine operation.

4,960,083

FAILSAFE METHOD IN CONNECTION WITH VALVE TIMING-CHANGEOVER CONTROL FOR INTERNAL COMBUSTION ENGINES

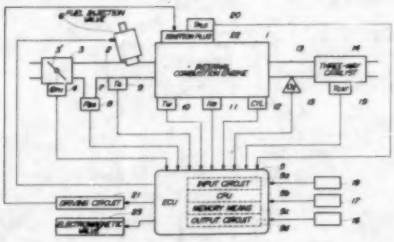
Yasunari Seki, and Isao Yahata, both of Wako, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 1, 1989, Ser. No. 388,647

Claims priority, application Japan, Oct. 11, 1988, 63-255291; Oct. 11, 1988, 63-255292; Oct. 11, 1988, 63-255293

Int. Cl.[5] F01L *1/34*

U.S. Cl. 123—90.16 **10 Claims**



1. A failsafe method in connection with valve timing-changeover control for an internal combustion engine, said engine including a set of inlet valves and a set of exhaust valves and being controlled by a control system having an electronic control unit, at least one of said sets of inlet and exhaust valves having valve timing thereof changeable between low speed valve timing suitable for a lower engine speed region and high speed valve timing suitable for a higher engine speed region, in response to a changeover-instructing signal generated by said electronic control unit;

said failsafe method comprising the steps of:

(1) detecting an abnormality in said control system of said engine;

(2) generating said changeover-instructing signal for changing the valve timing to the low speed valve timing in both of said lower and higher engine speed regions, when said abnormality is detected;

(3) detecting a value of at least one engine operating parameter; and

(4) when said abnormality is detected, correcting an air-fuel ratio of an air-fuel mixture to be supplied to said engine when said engine is in a predetermined operating condition determined by the detected value of said at least one engine parameter.

4,960,084

VALVE TIMING CONTROL SYSTEM FOR INTERNAL COMBUSTION ENGINE

Akio Akasaka; Seiji Suga, and Makoto Yasuda, all of Kanagawa, Japan, assignors to Nissan Motor Co., Ltd. and Atsugi Unisia Corp., both of Yokohama, Japan

Filed Sep. 29, 1989, Ser. No. 414,236

Claims priority, application Japan, Sep. 30, 1988, 63-128919[U]

Int. Cl.[5] F01L *1/34*

U.S. Cl. 123—90.17 **11 Claims**

1. A valve timing control system for adjusting angular phase relationship between an engine revolution synchronous element and a cam driving element, comprising:

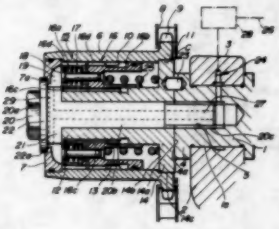
a first cylindrical component associated with said engine revolution synchronous element for co-rotation therewith;

a second cylindrical component oriented within the interior space of said first cylindrical component in coaxial and radially spaced relationship with said first cylindrical component, and associated with said cam driving element

for co-rotation therewith, said second cylindrical component having radial extension supporting one end of said first cylindrical component;

a third component disposed between said first and second components for transmitting rotational torque to said cam driving element via said second cylindrical component, said third component being movable relative to said first and second cylindrical components;

a fourth component cooperative with said third component for converting axial movement of said third component into an angular phase shift of one of said first and second



components relative to the other for causing variation of angular phase relationship between said engine revolution synchroneous element and a cam driving element at predetermined phase relationship; and

a fifth component for securing said first, second, third and fourth components in an assembled form, said fifth component including means for supporting the other end of said first component, said supporting means establishing sliding contact with said first cylindrical component for permitting relative angular displacement between said first and second cylindrical components.

4,960,085

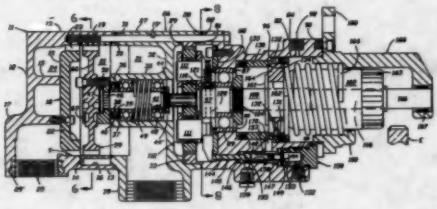
PNEUMATIC AND ELECTRO-PNEUMATIC STARTERS

Terry L. Coons, Dayton, Ohio, assignor to Tech Development Inc., Dayton, Ohio

Filed Aug. 31, 1988, Ser. No. 239,189

Int. Cl.[5] F02N 7/00; F01D 5/34

U.S. Cl. 123—179 F **17 Claims**



1. A turbine rotor comprising a plastic body including a disc portion having a ring portion peripheral thereto embodying turbine buckets formed integral with, projected radially from and spaced circumferentially of its outermost peripheral surface, said disc portion having a plate-like configuration distinguished by radial zones which differ in thickness including a solid central zone exhibiting its maximum thickness and a zone outwardly thereof of less thickness including means through which said rotor may be mounted for its connection to a shaft.

4,960,086

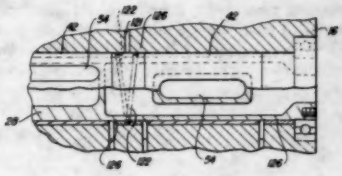
ROTARY VALVE CONSTRUCTION UTILIZING A COMPRESSED GAS AS LUBRICANT AND COOLANT

Louis J. Rassey, 15711 Twelve Mile Rd., Roseville, Mich. 48066

Filed Apr. 10, 1989, Ser. No. 335,730

Int. Cl.[5] F02M 13/00

U.S. Cl. 123—190 DL **26 Claims**



1. In an internal combustion engine of the type having a housing with at least one cylinder formed in the housing, at least one piston member reciprocally received in said cylinder, passage means formed in said housing for communicating a combustible mixture to said cylinder and for expelling exhaust gases from said cylinder, and at least one cylindrical rotary valve member rotatably housed substantially in a bore journalled in said housing, said rotary valve member having a diametric throughbore so that said rotary valve means selectively establishes fluid communication through said passage means at predetermined rotational positions of said rotary valve means, each of said rotary valve members have defined therein one or more peripheral channels, said one or more peripherally defined channels comprising a labyrinth, the improvement which comprises:

gas means for lubricating said rotary valve means; and

said gas means for lubricating including said bore and said rotary valve having a first toleranced diameter and a second toleranced diameter of a predetermined amount whereby a gas may circulate therebetween.

4,960,087

DEVICE FOR SIGNALLING FAULTY CONDITIONS IN MOTOR VEHICLE

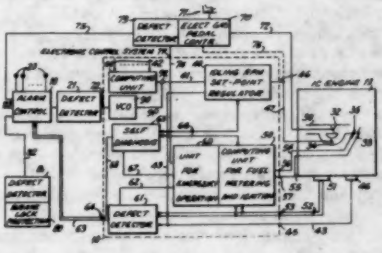
Erich Junginger, Stuttgart; Eberhard Schnaibel, Hemmingen, and Erich Schneider, Kirchheim, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 144,620, Jan. 11, 1988, abandoned, which is a continuation of Ser. No. 838,557, Mar. 11, 1986, abandoned. This application Jun. 26, 1989, Ser. No. 371,420

Claims priority, application Fed. Rep. of Germany, Mar. 22, 1985, 3510321

Int. Cl.[5] F02B 77/00

U.S. Cl. 123—198 D **18 Claims**



1. A device for signalling defect conditions in a motor vehi-

cle having an internal combustion engine, a control system including means for regulating a nominal idling speed of the engine in dependency on predetermined operational variables, means for detecting malfunction of predetermined component parts of the motor vehicle, an optical warning device coupled with the detecting means to visually indicate a detected malfunction, comprising means for generating a modulating error signal when a defect occurs in said optical warning device, and said generating means being coupled to said idling speed regulating means to modulate the nominal idle running of the engine in response to said error signal such as to simulate an abnormal idle running of the engine signalling the defect condition.

4,960,088

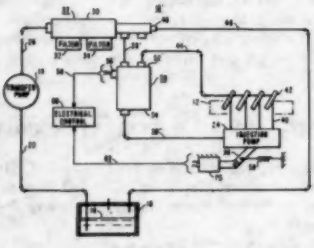
LOW FUEL SHUT-OFF SYSTEM

Robert K. Havemann; Herman H. Viegas, both of Bloomington, and Ricardo S. DeGrego, Northfield, all of Minn., assignors to Thermo King Corporation, Minneapolis, Minn.

Filed Sep. 8, 1989, Ser. No. 404,394

Int. Cl.[5] F02B *77/00*

U.S. Cl. 123—198 D **10 Claims**



1. In a low fuel shut-off system for a Diesel engine having a fuel supply circuit which includes a main fuel tank, a transfer pump, a filter array, an injection pump, and injection nozzles, the improvement comprising:

an auxiliary fuel tank in the fuel supply circuit, between the transfer pump and the injection pump, with the transfer pump maintaining fuel in said auxiliary fuel tank above a predetermined level during normal operation,

sensor means providing a signal when the level of fuel in said auxiliary fuel tank drops below said predetermined level, indicating the transfer pump is no longer providing sufficient fuel to said auxiliary fuel tank,

and electrical control means responsive to the signal provided by said sensor means for stopping the engine before depletion of the fuel in said auxiliary tank while maintaining fuel in the fuel supply circuit between said auxiliary tank and the injection pump, enabling re-starting of the engine without priming,

said control means including time delay means actuated upon start-up of the engine which prevents the signal provided by the sensor means from stopping the engine for a predetermined period of time.

4,960,089

COMBUSTION SYSTEM

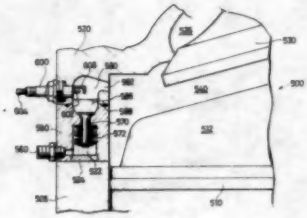
Michikata Kono, Tokyo; Yoshiyuki Wada, Chiba; Tetuya Kamihara, Kanagawa; Masahito Tatematsu, and Koichi Suda, both of Aichi, all of Japan, assignors to Aisan Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Nov. 20, 1989, Ser. No. 438,390

Claims priority, application Japan, Nov. 28, 1988, 63-298196; Nov. 7, 1989, 1-289438

Int. Cl.[5] F02B *19/00*; F02P *15/00*

U.S. Cl. 123—260 **8 Claims**



1. A fuel supply/ignition device comprising a combustion chamber, a fuel chamber formed adjacent to said combustion chamber and having an opening communicated with said combustion chamber, a fuel supply valve for supplying a liquid fuel under pressure into said fuel chamber, a spark plug provided in said fuel chamber, a fuel supply line having a fuel pump and a fuel metering device connected to said fuel supply valve, and a high-energy generator connected through a high-tension cord to said spark plug.

4,960,090

LOAD-SHIFTING DEVICE INTENDED FOR AN INTERNAL COMBUSTION ENGINE

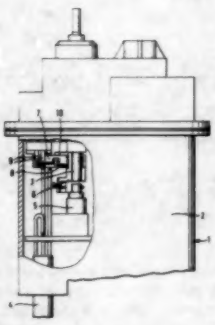
Gerald Muschalik, Eschborn/TS, and Winfried Hahn, Bad Soden/TS, both of Fed. Rep. of Germany, assignors to VDO Adolf Schindling AG, Frankfurt am Main, Fed. Rep. of Germany

Filed Apr. 4, 1989, Ser. No. 334,001

Claims priority, application Fed. Rep. of Germany, Jul. 6, 1988, 3822843

Int. Cl.[5] F02D *11/10*

U.S. Cl. 123—399 **10 Claims**



1. A load-shifting device for an internal combustion engine, the engine receiving a mixture of fuel and air by means of a throttle valve, the device comprising

a drive shaft for operating throttle valve;

a controlling-element switch which has a pivotally mounted switch arm and a switch contact;

a spring which urges the switch arm against the switch contact, the switch arm resting against the switch contact in an idling position for idling of the engine, the switch arm being moved from the switch contact above the idling position by the drive shaft against a force of the spring;

a housing; and

drive means operatively connected between the drive shaft and the switch arm, the drive means including a drive element connecting with the drive shaft and a stop positioned on the switch arm for engagement with the drive element, and wherein

the spring is a torsion spring which surrounds the drive shaft and has a first free leg and a second free leg, the spring being held fast to the housing by the first free leg, the second free leg resting, on the switch-contact side, against the switch arm;

the switch contact comprises a first pole, the switch including a second pole, the second free leg being oriented for contacting the first pole and the first free leg being positioned for connection to the second pole; and the drive means includes a swinging of the switch arm.

4,960,091

SAFETY CIRCUIT FOR ELECTRONIC VELOCITY CONTROL OR REGULATING SYSTEMS FOR MOTOR VEHICLES

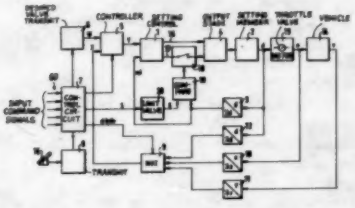
Rudolf Aufmkolk, Kelkheim, Fed. Rep. of Germany, assignor to VDO Adolf Schindling AG, Frankfurt am Main, Fed. Rep. of Germany

Filed Apr. 14, 1989, Ser. No. 338,877

Claims priority, application Fed. Rep. of Germany, Oct. 29, 1988, 3836913

Int. Cl.[5] F02D *41/22, 11/10*

U.S. Cl. 123—399 **11 Claims**



1. A safety circuit in an electronic velocity control system for a motor vehichle with idling control, the system including

a setting device for adjusting the power of an engine of the motor vehicle;

means for feeding a desired value to the setting device, the setting device comprising a setting controller, an output stage and a setting member;

a throttle valve for controlling power of the engine, the throttle valve being operated by the setting member in response to an output signal of the output stage of the setting device, the controller operating a control signal which is fed to the output stage to provide the output signal for the setting member; and wherein

the safety circuit comprises

a switch device, a comparator, means for generating an actual value signal giving the position of the throttle valve, and means for generating a limit value signal; and wherein

said switch device prevents a regulating of said output stage in a direction towards an opening of the throttle valve as a function of an output signal of the comparator, the actual-value signal and the limit value signal being fed to input terminals of the comparator, the limit value signal having a value necessary for idle control at least upon a disconnection of control by the system.

4,960,092

ENGINE CONTROL SYSTEM

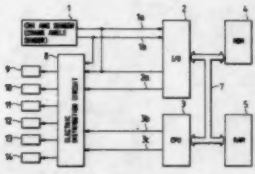
Shoji Sasaki, and Kenji Tabuchi, both of Katsuta, Japan, assignors to Hitachi, Ltd., Tokyo and Hitachi Automotive Engineering Co., Ltd., Ibaraki, both of, Japan

Filed Oct. 24, 1989, Ser. No. 426,058

Claims priority, application Japan, Nov. 2, 1988, 63-276259

Int. Cl.[5] F02D *45/00, 11/00*

U.S. Cl. 123—414 **8 Claims**



1. An engine control system in which ignition timing control is effected on the basis of angle ignition signals, said system comprising:

reference signal generating means for generating reference signals each outputted at each first predetermined rotational angle interval of the engine, said reference signals each having a constant angular relation to a top dead center of each cylinder of the engine;

position signal generating means for generating position signals for controlling the ignition timing, said position signals each having a second predetermined rotational angle interval shorter than said first predetermined rotational angle interval;

angle ignition signal generating means for generating an angle ignition signal on the basis of said reference signal and said position signal;

clock signal generating means for generating clock signals with a constant time period;

time ignition signal generating means for generating a time ignition signal on the basis of said reference signal and said clock signal;

abnormality detecting means for detecting abnormality in the position signals; and

output selecting means for selecting and outputting the angle ignition signals in a normal state and the time ignition signals when the abnormality in the position signals is detected, whereby the ignition timing is controlled in both normal and abnormal states of the position signal.

4,960,093

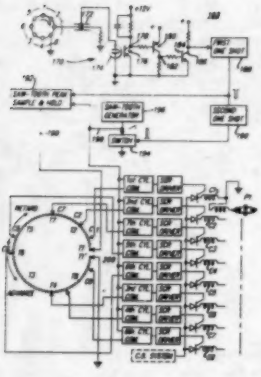
INTERNAL COMBUSTION ENGINE IGNITION SYSTEM AND CLEANING DEVICE

John A. McDougal, 2801 S. Port Hwy., A-4, Flint, Mich. 48507, and John W. Lennington, Ypsilanti, Mich., assignors to John A. McDougal, Detroit, Mich.

Continuation of Ser. No. 187,933, Apr. 29, 1988, Pat. No. 4,809,662, which is a continuation of Ser. No. 137,195, Dec. 23, 1987, abandoned, which is a division of Ser. No. 873,075, Jun. 2, 1986, Pat. No. 4,718,381, which is a continuation of Ser. No. 651,042, Sep. 14, 1984, abandoned, which is a continuation of Ser. No. 374,803, May 14, 1982, Pat. No. 4,471,737, which is a continuation of Ser. No. 161,282, Jun. 20, 1980, abandoned, which is a division of Ser. No. 934,322, Aug. 16, 1978, Pat. No. 4,257,373, which is a division of Ser. No. 800,959, May 26, 1977, Pat. No. 4,116,173, which is a continuation of Ser. No. 572,167, Apr. 28, 1975, abandoned, which is a division of Ser. No. 336,559, Feb. 28, 1973, Pat. No. 3,903,856. This application Feb. 14, 1989, Ser. No. 310,837

Int. Cl.[5] F02P 5/15

U.S. Cl. 123—416 14 Claims



1. A method of controlling the ignition timing in an internal combustion engine having a plurality of combustion chambers, comprising the steps of:

generating a first signal in accordance with an operating cycle of said internal combustion engine, said first signal having a periodic occurrence in said operating cycle which is less than the number of combustion chambers for said internal combustion engine;

generating a second signal which is triggered in response to the occurrence of said first signal, said second signal having a variable characteristic which is indicative of the current position in said operating cycle of said engine; and

generating a timing signal for each of said combustion chambers in response to said variable characteristic of said second signal so as to establish an ignition timing relationship for each of said combustion chambers which is related to said operating cycle of said internal combustion engine.

4,960,094

KNOCKING CONTROL SYSTEM FOR INTERNAL COMBUSTION ENGINES

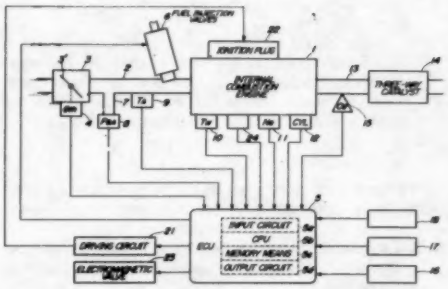
Yuzuru Koike; Yukio Miyashita; Yoshiaki Akimoto; Yasunari Seki, and Isao Yahata, all of Wako, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 10, 1989, Ser. No. 419,575

Claims priority, application Japan, Oct. 11, 1988, 63-255296; Oct. 11, 1988, 63-255297

Int. Cl.[5] F01L 1/34; F02D 13/02, 43/00; F02P 5/15

U.S. Cl. 123—425 10 Claims



1. A knocking control system for an internal combustion engine having inlet valves and exhaust valves, at least one of said inlet valves and said exhaust valves having valve timing thereof controlled by valve timing control means depending on operating conditions of said engine,

the system comprising:

valve timing detecting means for detecting the valve timing controlled by said valve timing control means;

knocking parameter detecting means for detecting a detection parameter indicative of knocking occurring in said engine;

knocking discriminating means for determining whether or not knocking has occurred in said engine on the basis of said detection parameter detected by said knocking parameter means and at least one discrimination parameter;

knocking control means responsive to an output from said knocking discriminating means indicative of a determination result that knocking has occurred, for controlling an operation of said engine by the use of at least one control parameter, so as to eliminate knocking;

parameter value selecting means for selecting a value of at least one of said at least one discrimination parameter and said at least one control parameter, which corresponds to the valve timing detected by said valve timing detecting means;

abnormality detecting means for detecting abnormality in said valve timing control means; and

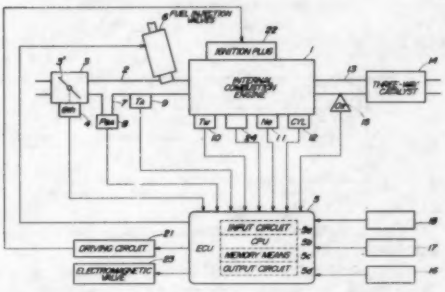
failsafe means for holding the valve timing at predetermined valve timing irrespective of an operating condition in which said engine is operating, and selecting a valve of at least one of said at least one discrimination parameter and said at least one control parameter, which correspond to said held predetermined valve timing, when abnormality in said valve timing control means is detected by said abnormality detecting means.

4,960,095

KNOCKING CONTROL SYSTEM FOR INTERNAL COMBUSTION ENGINES

Yuzuru Koike, and Tsao Yahata, both of Wako, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 4, 1989, Ser. No. 417,229
Claims priority, application Japan, Oct. 11, 1988, 63-255295
Int. Cl.[5] F02D *13/02, 43/00;* F01L *1/34;* F02P *5/15*
U.S. Cl. 123—425 18 Claims



1. A knocking control system for an internal combustion engine having inlet valves and exhaust valves, at least one of said inlet valves and said exhaust valves having valve timing thereof controlled by valve timing control means depending on operating conditions of said engine,

the system comprising:

valve timing detecting means for detecting the valve timing controlled by said valve timing control means;

knocking parameter detecting means for detecting a detection parameter indicative of knocking occurring in said engine;

knocking discriminating means for determining wheter or not knocking has occurred in said engine on the basis of said detection parameter detected by said knocking parameter means and at least one discrimination parameter;

knocking control means responsive to an output from said knocking discriminating means indicative of a determination result that knocking has occured, for controlling an operation of said engine by the use of at least one control parameter; and

paremeter value selecting means for selecting a value of at least one of said at least one discimination parameter and said at least one control parameter, which corresponds to the valve timing detected by said valve timing detecting means.

4,960,096

ADAPTER FOR INTAKE MANIFOLD

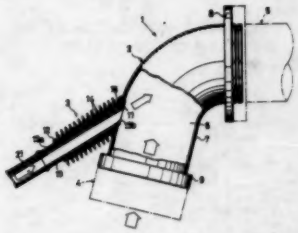
Minobu Sukimoto; Hitoshi Akiyoshi, both of Tochigi; Seijiro Taguchi, Ibaraki, and Tadaaki Morita, Tochigi, all of Japan, assignors to Showa Aluminum Corporation, Sakai, Japan

Filed Nov. 17, 1989, Ser. No. 437,713
Claims priority, application Japan, Nov. 18, 1988, 63-293291; Nov. 18, 1988, 63-293292
Int. Cl.[5] F02M *25/07*
U.S. Cl. 123—570 8 Claims

1. An intake manifold adapter attachable to the inlet end of an intake manifold and connectable to means for holding an air cleaner in communication with the intake manifold, the adapter being adapted for use in connecting to the intake manifold a pipe for returning the exhaust gas from an engine to the intake manifold, the adapter comprising:

an adapter body made of aluminum and having a gas channel adapted to communicate at its one end with the outlet of the communication means and at the other end thereof with the inlet of the intake manifold, and

an exhaust gas inlet pipe having an aluminum portion at its one end and a stainless steel portion secured to the aluminum portion and providing the other end of the inlet pipe, the inlet pipe being fixed to the adapter body by the aluminum portion being metallurgically joined to the adapter body, the stainless steel portion providing a joint for the pipe for returning the exhaust gas from the engine.

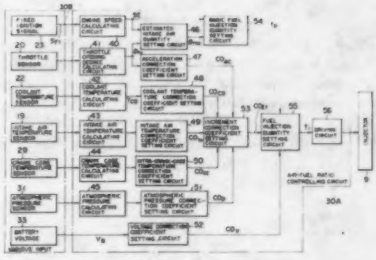


4,960,097

AIR-FUEL RATIO CONTROL SYSTEM FOR TWO-CYCLE ENGINE

Fusao Tachibana; Hideyuki Ishikawa, and Kazuo Suzuki, all of Tokyo, Japan, assignors to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 15, 1989, Ser. No. 436,692
Claims priority, application Japan, Nov. 18, 1988, 63-150618
Int. Cl.[5] F02D *41/34*
U.S. Cl. 123—494 6 Claims



1. An air-fuel ratio control system for a two-cycle engine having a cylinder, a crank case serving also as a pressure chamber to supply the intake air to the cylinder, a fuel injection unit including an injector and injection pump, engine speed detection means for detecting an engine speed, and throttle opening degree detection means for detecting opening degree of a throttle valve, said air fuel ratio control system comprising:

crank case temperature detection means for detecting the temperature of said crank case;

first setting means for setting an increment correction coefficient for increasing a fuel injection quantity, in dependency on the temperature of said crank case detected by said crank case temperature detection means;

second setting means for setting a basic fuel injection quantity in response to said engine speed and said throttle opening degree respectively detected by said engine speed detection means and said throttle opening degree detection means; and

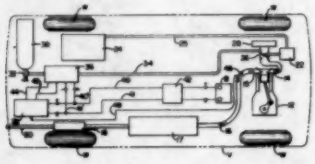
third setting means for setting a fuel injection quantity by correcting said basic fuel injection quantity set by said second setting means in accordance with said increment correction coefficient set by said first setting means.

4,960,098

METHOD AND APPARATUS FOR MAINTAINING OPTIMUM OXYGEN LEVEL IN COMBUSTION ENGINES

Richard Akerib, Westminster, Colo., assignor to E-Quad, Inc., Westminster, Colo.

Filed Jul. 8, 1988, Ser. No. 222,058
Int. Cl.[5] F02M *23/00*
U.S. Cl. 123—589 **10 Claims**



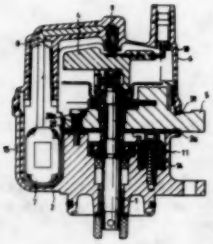
1. The method for maintaining an optimum stoichiometric condition in an engine having a fuel/air mixture device in which an air stream is mixed with fuel comprising the steps of sensing the amount of pollutants in the exhaust gas from the engine, generating an electrical signal representing the amount of pollutants in the exhaust, amplifying said signal into a control voltage signal, providing a supplementary source of oxygen under pressure, interposing a flow control valve between said source of oxygen and said fuel/air mixing device, and regulating the degree of opening of said flow control valve in proportion to the control voltage signal generated whereby to regulate the mass rate of oxygen flow delivered from said source of oxygen into said fuel/air mixing device in order to reduce the ratio of nitrogen to oxygen in the air stream.

4,960,099

DISTRIBUTOR FOR INTERNAL COMBUSTION ENGINE

Junichi Shimada, Hitachi; Kazutoshi Kobayashi, Katsuta; Norio Moriyama, Katsuta, and Kazuhiko Kawakami, Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 8, 1989, Ser. No. 404,640
Claims priority, application Japan, Sep. 19, 1988, 63-232508
Int. Cl.[5] F02P *7/00*
U.S. Cl. 123—647 **12 Claims**



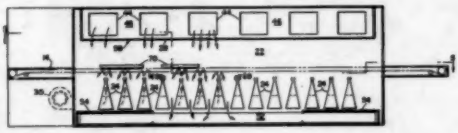
1. A distributor for an internal combustion engine, comprising: a housing having a bottom an open end and a side wall between said bottom and said open end; a shaft inserted in said housing and mounted to rotate and be driven synchronously with an engine crankshaft; a rotor head mounted on said shaft; a cap attached to said housing so as to cover said rotor head; and a signal detector accommodated in said housing and having a connector projecting outside said housing; said housing having a cut-out portion formed in said side wall so as to extend toward said bottom of said housing from said open end for receiving said connector, and a gasket having a smaller part surrounding said connector and fitted in said cut-out portion of said housing and a larger part disposed on said open end and pressed between said housing and said cap, whereby a sealing around said connector and an abutment between said housing and said cap is formed.

4,960,100

CONVEYOR OVEN

Jack E. Pellicane, Glendale Hgts., Ill., assignor to Mastermatic, Inc., Villa Park, Ill.

Filed Mar. 13, 1989, Ser. No. 322,256
Int. Cl.[5] F24C *15/32*
U.S. Cl. 126—21 A **15 Claims**



1. A versatile conveyor oven effective to produce a variety of different cooking condition comprising:

an elongated hollow cabinet defining a cooking chamber having an inlet port at one end and an outlet port at an opposite end;

an open mesh conveyor extending through the cabinet from outside the inlet to outside the outlet and means for moving said conveyor relative to said cabinet along a path of travel in a predetermined diretion through the cooking chamber so that product to be cooked placed on the conveyor at the inlet will travel on the conveyor through the cooking chamber to the outlet;

foraminous plate means disposed within the cooking chamber above said conveyor and extending substantially from the inlet to the outlet for dispensing a blanket of high velocity heated air downwardly onto the upper surface of the conveyor at mutually spaced zones along the length thereof;

nozzle means disposed within the cooking chamber below said conveyor and extending substantially from the inlet to the outlet for dispensing mutually spaced discrete jets of heated air upwardly onto the lower surface of said conveyor along the length thereof, each jet extending laterally across the width of said conveyor;

heating means and blower means coupled thereto for supplying heated air to said plate means and nozzle means;

first means coupled to said plate means for spacing the high velocity heating zones a predetermined distance apart; and

second means coupled to said nozzle means for spacing the discrete jets a predetermined distance apart.

4,960,101

ASSEMBLY FOR A VARIABLE POSITION GAS BARBECUE BURNER

William Home, Taipei, Taiwan, assignor to Grand Hall Enterprise Co., Ltd., Taipei, Taiwan

Filed Nov. 3, 1989, Ser. No. 431,126
Int. Cl.[5] F24C *3/00*
U.S. Cl. 126—41 R **3 Claims**

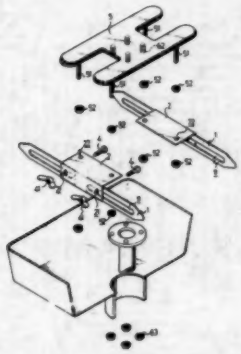
1. An assembly for a variable position gas barbecue burner comprising:

a burner, on an underside of which are disposed four screws with four pairs of corresponding bolts;

a pair of props, which are essentially bracket-shaped and are formed with vertically oriented through holes in a vertical face thereof and horizontally oriented through holes in a horizontal face thereof, said horizontally oriented through holes corresponding with respective said screws of the burner, said screws of the burner being passable through respective horizontally oriented through holes, said hori-

zontally oriented through holes being sandwich between respective pairs of said nuts, said nuts being synchronously rotatable around said burner screws for raising and lowering said burner with respect to said horizontal faces of said props;

two pairs of guide blades with slots, said slots respectively corresponding with respective said vertically oriented through holes;



two pairs of screws with corresponding wing nuts, said screws being passable through respective said vertically oriented through holes, and, in turn, through respective said corresponding slots, such that said each respective pair of guide blade are fixable to each said corresponding prop by means of respective screws and wing nuts, and such that by tightening said wing nuts a position of said props with respect to corresponding pair of guide blades is fixable, and by loosening said wing nuts said props are slidable along respective corresponding guide blades.

4,960,102

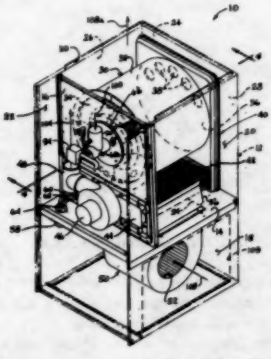
FUEL-FIRED CONDENSING TYPE FORCED AIR HEATING FURNACE

Timothy J. Shellenberger, Fort Smith, Ark., assignor to Rheem Manufacturing Company, New York, N.Y.

Filed Feb. 5, 1990, Ser. No. 475,181

Int. Cl.[5] F24H *3/02*

U.S. Cl. 126—110 R **13 Claims**



1. A fuel-fired, condensing type forced air heating furnace comprising:

a housing having a heating chamber with an air inlet opening and a supply air outlet opening, and a return chamber communicating with said heating chamber through said air inlet opening and having a return air intake opening;

a generally cylindrical primary heat exchanger extending along a central longitudinal axis and disposed within said heating chamber, said primary heat exchanger having a generally circular front inlet end wall and generally circular rear discharge end wall spaced apart from said front inlet end wall along said central longitudinal axis;

a transfer manifold disposed within said heating chamber and having a first end portion extending outwardly across and covering said rear discharge end wall of said primary heat exchanger, and a second end portion extending from said primary heat exchanger toward said return chamber in a direction generally transverse to said central longitudinal axis;

a condensing heat exchanger disposed within said heating chamber and positioned between said primary heat exchanger and said air inlet opening, said condensing heat exchanger having an inlet end operatively connected to said second end portion of said transfer manifold, and an outlet end,

said rear discharge end wall of said primary heat exchanger having diametrically opposite first and second peripheral portions spaced apart in said transverse direction, said second peripheral portion being positioned between said first peripheral portion and said condensing heat exchanger;

fuel/air burner means for generating an annular, generally radially directed flame pattern coaxially disposed within an inlet end portion of said primary heat exchanger and for producing hot combustion gases within said inlet end portion of said primary heat exchanger;

discharge opening means, formed in only an upper half of said rear discharge end wall of said primary heat exchanger through only said first peripheral portion thereof, for flowing said hot combustion gases from the interior of said primary heat exchanger into said first end portion of said transfer manifold;

draft inducer fan means having an inlet operatively connected to said outlet end of said condensing heat exchanger, said draft inducer fan means being operative to draw said hot combustion gases sequentially through said primary heat exchanger discharge opening means, said transfer manifold and said condensing heat exchanger and then discharge the combustion gases; and

supply blower means for sequentially flowing air to be heated into said return chamber through said return air intake opening, into said heating chamber through said air inlet opening, through said heating chamber and externally across said condensing heat exchanger, said transfer manifold and said primary heat exchanger, and outwardly through said supply air outlet opening,

the positioning of said discharge opening means in only said first peripheral portion of said rear discharge end wall of said primary heat exchanger causing essentially all of the hot combustion gases discharged from said primary heat exchanger to flow in said transverse direction along generally the entire outer side surface area of said rear discharge end wall and through the entire length of said first end portion of said transfer manifold to thereby prevent short circuiting of the discharged combustion gases flowing from said primary heat exchanger to said condensing heat exchanger through said transfer manifold.

4,960,103

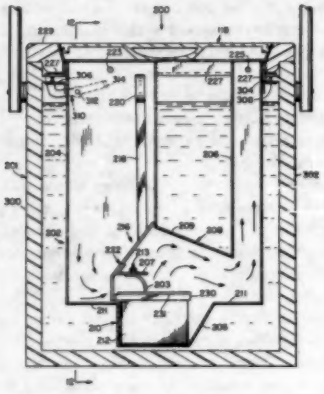
VERSATILE HEATER/COOLER

Charles L. Urso, 215 Newton St., Waltham, Mass. 02154

Continuation-in-part of Ser. No. 212,505, Jun. 28, 1988, Pat. No. 4,898,148. This application Jun. 30, 1989, Ser. No. 373,462

Int. Cl.[5] A61F *7/00*

U.S. Cl. 126—204 **11 Claims**



1. A heater for heating liquid comprising:

a first conduit having a hollow interior and upper and lower end portions wherein the upper end portion includes an opening for fluid communication between the conduit interior and the outside atmosphere;

a second conduit having a hollow interior and upper and lower end portions wherein the upper end portion includes an opening for fluid communication between the second conduit interior and the outside atmosphere; and

a body defining at least a portion of a combustion chamber, the body being connected with the lower end portions of the first and second conduits such that the chamber is in fluid communication with the interiors of the conduits, the body having a roof for transferring heat to a liquid environment in which the body can be submerged, the roof having an underside positioned directly over the chamber wherein the underside is sloped to extend in a downward direction to a lateral portion of the chamber and generally downward toward the second conduit, the body having a floor below the rood, the roof underside being generally sloped upward toward the first conduit such that the vertical distance within the chamber between the floor and the roof generally increases as the distance toward the first conduit decreases.

4,960,104

METHOD AND APPARATUS FOR SOLAR HEATING FLUID

Mona Scharmer, 2455 Park Hill Dr., Longview, Wash. 98632

Filed Jul. 17, 1989, Ser. No. 380,398

Int. Cl.[5] F24J *2/42*

U.S. Cl. 126—416 **21 Claims**

1. A method for heating a fluid comprising the steps of:

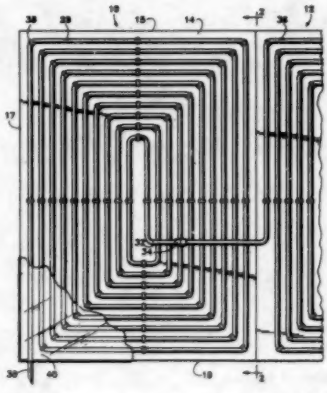
providing a substantially planar surface;

coiling a plurality of hoses adjacent one another on said surface so that each hose forms a first layer of substantially planar spiral coils having an inner end and an outer end;

connecting the inner end of each spiral to the outer end of the next adjacent spiral by placing the inner end over a portion of the first hose layer thereby forming a second layer of hose comprising a single section thereof which extends from the inner end of the spiral to the outer end of the next adjacent spiral;

wrapping a sheet of solar-ray penetrating film over the hoses by placing the film directly on the hoses so that the second layer of hose supports the film and spaces it away from substantially all of the first layer of hose thereby forming a plenum;

connecting the outer end of the first hose to a source of fluid;



exposing the film to solar rays; and

circulating the fluid through the hoses.

4,960,105

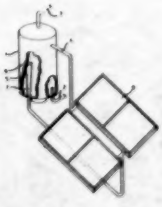
SUN OPERATED BOILER FOR HEATING LIQUIDS

Josef Gantz, No. 11 Sokolov Street, and Menahem Tenenboim, 14 Chatam Sofer Street, both of Beney Braq, Israel

Filed May 22, 1989, Ser. No. 355,279

Int. Cl.[5] F24J *2/04*

U.S. Cl. 126—437 **2 Claims**



1. Apparatus for heating a liquid by insolation, comprising:

a storage tank;

a circulation pipe having an upper top inlet port in an upper portion of said storage tank and a lower side inlet port in a lower portion of said storage tank;

a solar collector, said solar collector and said storage tank being interconnected by said circulation pipe which extends upwardly through a substantial portion of said storage tank from below; and,

means for transferring the liquid from said solar collector to said storage tank after the liquid has been heated.

4,960,106

ENDOSCOPE APPARATUS

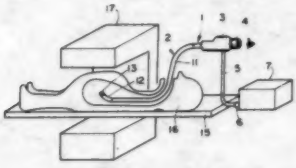
Hiroaki Kubokawa; Takashi Tsukaya, both of Hachioji; Yasuhiro Ueda, Kokubunji; Takeaki Nakamura, Hino; Yutaka Ohshima, Hachioji; Hiroki Hibino, Hachioji; Shyuichi Takayama, Hachioji, and Tadao Hagino, Yokohama, all of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

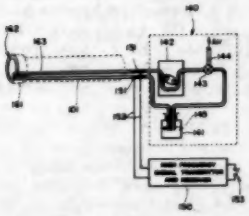
Filed Apr. 27, 1988, Ser. No. 186,852

Claims priority, application Japan, Apr. 28, 1987, 62-105869; Jul. 8, 1987, 62-171942; Jul. 15, 1987, 62-176532; Aug. 10, 1987, 62-199396; Aug. 10, 1987, 62-199395; Aug. 10, 1987, 62-199393; Aug. 11, 1987, 62-200292; Aug. 18, 1987, 62-205539; Aug. 18, 1987, 62-205540

Int. Cl.[5] A61B *1/00, 5/055*

U.S. Cl. 128—6 23 Claims





1. An NMR metering endoscope apparatus comprising:

an endoscope body provided with an elongate insertable part having a rear end and a tip part including a tip surface at a front end thereof, an observing window and an illuminating window in the tip part, an observing means for observing an object by receiving light coming from the object entering through said observing window, and an illuminating light outputting means for emitting an illuminating light out of said illuminating window; and

an NMR metering loop-like antenna fitted to said insertable part tip part by a supporting part so as to be outside the insertable part, said NMR antenna including connecting means for connection to an NMR metering apparatus.

4,960,107

ULTRASONIC MEDICAL TREATMENT APPARATUS

Satoshi Aida, Kanagawa; Nobuyuki Iwama, Tokyo; Syuzi Suzuki, and Akihiro Ishiguro, both of Kanagawa, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Sep. 30, 1988, Ser. No. 251,839

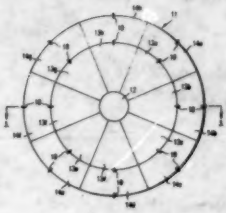
Claims priority, application Japan, Sep. 30, 1987, 62-249035; Apr. 26, 1988, 63-101310

Int. Cl.[5] A61B *17/22*

U.S. Cl. 128—24 A 11 Claims

1. An ultrasonic medical treatment apparatus comprising:

an ultrasonic generating element for generating ultrasonic energy for treatment of a patient, said element including a plurality of unit elements each unit element having one of two or more different shapes, and said unit elements having surface areas substantially equal to each other, wherein the total area occupied by said unit elements is



substantially equal to the area of said ultrasonic generating element.

4,960,108

LASER-INDUCED SHOCKWAVE LITHOTRIPSY

Erich Reichel; Heinz Schmidt-Kloiber, both of Graz, and Karl Groke, Eggersdorf, all of Austria, assignors to Leopold & Co. Chem. Pharm. Fabrik Gesellschaft M.B.H., Graz, Austria

Filed Aug. 26, 1988, Ser. No. 237,228

Claims priority, application Fed. Rep. of Germany, Aug. 28, 1987, 3728814

Int. Cl.[5] A61B *17/22*

U.S. Cl. 128—24 A 9 Claims

1. In a method for laser-induced shockwave lithotripsy comprising:

a. surrounding a concrement to be destroyed with an aqueous solution and

b. feeding pulsed laser radiation of a wave length situated on the infrared region via an optical wave guide to the immediate vicinity of the concrement,

whereby said laser radiation in a vicinity of the surface of the concrement is concentrated,

thereby generating in said aqueous solution laser-induced breakdowns, said breakdowns effecting shockwaves and cavitation in said aqueous solution in the immediate vicinity of said concrement, and

thereby destroying the concrement with said shockwaves while the concrement is continuously rinsed with the aqueous solution during said pulsed laser radiation,

wherein the improvement comprises said aqueous solution containing at least one metal compound selected from the group consisting of water-soluble salts of metals of the ferrous group of the periodic table, complex compounds of said metals of the ferrous group of the periodic table, water-soluble salts of magnesium and water soluble salts of calcium, said metal compound being present in a concentration not exceeding 50 mmol/l, based on its metal content.

4,960,109

MULTI-PURPOSE TEMPERATURE SENSING PROBE FOR HYPERTHERMIA THERAPY

Padmakar P. Lele, Winchester, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Jun. 21, 1988, Ser. No. 209,518

Int. Cl.[5] A61B *5/00*

U.S. Cl. 128—736 9 Claims

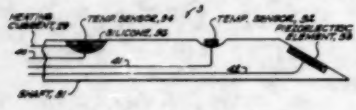
1. A probe for use in a hyperthermia system, the probe comprising

a probe body adapted for insertion into a target region of tissue within a subject during hyperthermic treatment, said probe body including a region of a selected standard material having a known energy absorption characteristic, and

at least one pair of thermal sensors carried by the probe body

and disposed in proximity to each other, the paired sensors comprising

a first thermal sensor for measuring the temperature of the tissue and



a second thermal sensor, disposed within said standard material, for measuring the temperature of said standard material,

whereby measurements from said first and second sensors can be compared to derive an energy absorption characteristic of tissue within the target region.

4,960,110

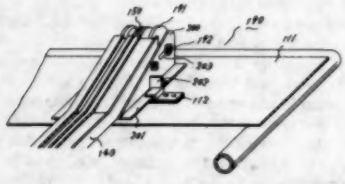
BED-TYPE MASSAGING APPARATUS

Yoshikiyo Yamasaki, Osaka, Japan, assignor to Kabushiki Kaisha Fuji Iryoki, Osaka and Kabushiki Kaisha Japan Health, Sakai, both of, Japan

Continuation of Ser. No. 182,478, Apr. 15, 1988, abandoned. This application Nov. 15, 1989, Ser. No. 437,761

Int. Cl.[5] A61H *15/00*

U.S. Cl. 128—52 **2 Claims**



1. A bed-type massaging apparatus comprising a flexible frame body having a pair of flexible rails disposed in parallel relationship, each of said flexible rails comprising a flexible coupler; a driving means for moving a belt in a reciprocating fashion, said driving means comprising a reversible motor having an output shaft and a driving gear attached thereto and a transmission shaft having a transmission gear attached thereto and meshed with said driving gear; a massaging roller attached to said belt; tensioning means for adjustingly regulating the tension of said belt, said tensioning means comprising an adjusting device positioned at one side of the frame body and means for placing said belt under tension provided at another side of said frame body; position detection means for determining the location of said massaging roller, said position detection means comprising a screw shaft secured on an outside surface of said transmission shaft; a mover member threaded onto said screw shaft so that the rotation of said screw shaft imparts linear movement to said mover member, a limit switch contacting member attached to said mover member and extending laterally therefrom, a guide bar positioned in parallel relationship with said transmission shaft, and limit switches positioned on said guide bar so as to confine the movement of said limit switch contacting member therebetween; and control means for regulating the location of said massaging roller along said flexible rails.

4,960,111

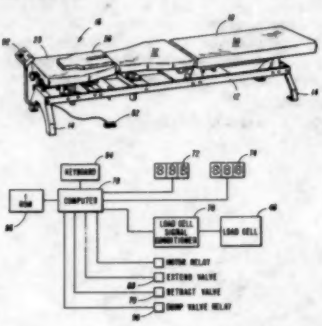
CHIROPRACTIC TABLE

Lloyd A. Steffensmeier, 102-122 W. Main St., Lisbon, Iowa 52253

Filed Aug. 5, 1988, Ser. No. 228,986

Int. Cl.[5] A61F *5/00*

U.S. Cl. 128—72 **7 Claims**



1. An apparatus for assisting a health professional in the treatment of a patient by applying force to a selected part of the patient's body, said apparatus comprising: patient support means to support the portion of the patient'body to be treated, force-applying means for exerting a controlled force on the patient by abruptly moving the patient support means a predetermined distance from an initial position and returning it to the initial position during a single cycle of the force-applying means, computer means having means for automatically repeating a cycle of the force-applying means, means operable by the health professional for selecting the amount of the force exerted by the force-applying means, means for controlling the number and rate of the cycles of the force-applying means and means for measuring and displaying the total force applied to the patient by the force-applying means during a cycle and the force manually applied to the patient by the health professional, and means operable by the health professional for controlling the rate of the application of the force applied to the patient.

4,960,112

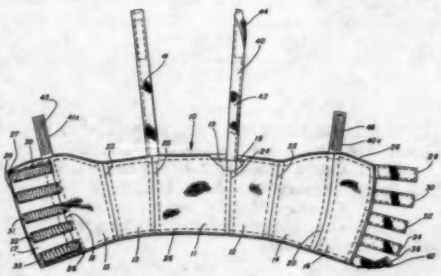
BREAST BINDER FOR SUPPRESSION OF POSTPARTUM LACTATION

Linda S. Anderegg, 5236 S. Melvina, Chicago, Ill. 60638

Filed Aug. 21, 1989, Ser. No. 396,039

Int. Cl.[5] A61F *5/02, 5/04;* A41B *1/18*

U.S. Cl. 128—78 **6 Claims**



1. A breast binder adapted to encircle the upper torso of a wearer and apply releasable and adjustable compression and uplift to the breasts, said binder comprising:

a first binder section having a plurality of non-stretchable cloth panels each said panel joined end to end with adja-

cent panels to form a continuous section of length sufficient to encircle the upper torso;

a second binder section essentially identical in construction and form to the first section and being joined to it in an overlapping arrangement to form a two-layered binder;

a plurality of releasable and independently adjustable fastening means vertically disposed along the ends of the two-layered binder for applying breast-conforming compression to the breasts sufficient to cause cessation of lactation; and

shoulder straps attached to the top edge of the two-layered binder and having releasable and adjustable fastening means to provide uplift support to the breasts sufficient to relieve the discomfort of breast engorgement.

4,960,113

ERECTION AID

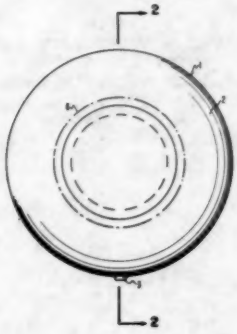
Herbert Seeberg-Elverfeldt, Curtiusstrasse 22, D-4006 Erkrath 2, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 47,489, May 11, 1987, abandoned. This application Jan. 23, 1989, Ser. No. 299,641

Claims priority, application Fed. Rep. of Germany, May 21, 1986, 3617027

Int. Cl.[5] A61F *5/41*

U.S. Cl. 128—79 **1 Claim**



1. An erection aid comprising

an endless tube of soft and elastic material forming an annular body having a central axis and dimensioned to surround the human penis, the outer diameter of said tube being substantially the same in both the axial and radial directions of the annular body; and

valve means in said tube to permit selective inflow and outflow of air to thereby selectively increase and decrease the pressure within said tube,

the wall of said tube being formed with nonuniform thickness,

the thickness of that portion of the tube wall equal to about one-fourth of the circumference of said wall facing inwardly toward said central axis, as viewed in section along a plane containing said axis, being significantly thinner and more easily deformable than the remaining, thicker, outwardly facing wall portions, equal to about three-quarters of the circumference of said wall,

the wall thickness changing along transition lines each having a diameter substantially equal to the outer diameter of a flaccid penis so that as the pressure within said tube is increased the diameter of the inwardly facing surface of said tube decreases substantially uniformly to apply pressure to the penis,

said thicker portions being sufficiently elastic so that the diameter of said transition lines can increase with the growing diameter of the tumescing penis, thereby avoiding excessive constriction of the penis.

4,960,114

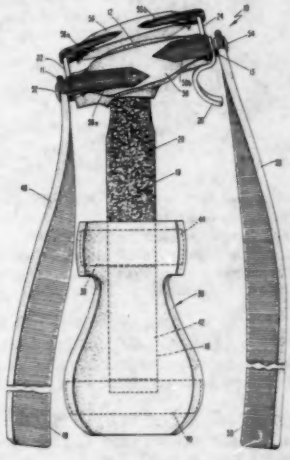
HAND SPLINT FOR STROKE PATIENTS

Charles L. Dale, 8666 111th St., N., Seminole, Fla. 34642

Filed Oct. 11, 1989, Ser. No. 419,992

Int. Cl.[5] A61F *5/00*

U.S. Cl. 128—87 R **23 Claims**



1. A hand splint comprising:

a base member;

said base member being configured to support a human hand in a slightly open fist position;

an elongate, rigid base supporting member of flat, lineal configuration;

said rigid base supporting member having a first side and a second side;

said rigid base supporting member having a first, leading end and a second, trailing end longitudinally spaced therefrom;

said base member being fixedly secured to said first end of said base supporting member;

a cradle member for cradling the forearm of a stroke patient;

a hook and loop fastening means being fixedly secured to a bottom side of said cradle member;

at least a first side of said rigid base supporting member being covered by a second hook and loop fastening means complemental to said first hook and loop fastening means so that at least a first side of said rigid base supporting member is releasably securable to the bottom side of said cradle member and

means circumscribing a patient's wrist and said base supporting member to hold the patient's forearm wholly within said cradle member.

4,960,115

BODY SUPPORT APPARATUS

Peter Ranciato, 74 School House Rd., Wallingford, Conn. 06492

Filed Aug. 5, 1988, Ser. No. 229,003

Int. Cl.[5] A61F *5/00*

U.S. Cl. 128—87 R **20 Claims**

1. A support device for enabling paralytics to stand erect, comprising an inflatable flexible, housing member having a back portion adapted to be longitudinally fitted to the back of a paralytic and extending into two leg portions adapted to be fitted to the rear of the legs of a paralytic, said housing member defining inflatable chambers, said chambers being joined together at edges thereof at said back portion and separating into

leg portions, a first securing means affixed to said back portion of said housing at the side thereof for engaging a paralytic, other securing means affixed to each of the leg portions of said housing member at the side thereof for engaging a paralytic, said first securing means arranged to pass over the chest of a

paralytic and secure said back portion to the paralytic, said other securing means being arranged to pass around the legs of a paralytic and secure said leg portions to the paralytic, said housing member upon inflation of said chambers being effective to raise a paralytic to an erect position.

4,960,116

ORTHOPAEDIC SPLINTING MATERIAL

Richard Milner, Bishops Stortford, United Kingdom, assignor to Smith and Nephew Associated Companies p.l.c., United Kingdom

Filed Jun. 8, 1988, Ser. No. 204,084

Claims priority, application United Kingdom, Jun. 12, 1987, 8713746; Feb. 25, 1988, 8804382

Int. Cl.[5] **A61F** *5/04*

U.S. Cl. 128—90 **5 Claims**

1. A low tack orthopaedic splinting material which comprises a substrate coated with a water curable composition comprising an isocyanate resin which has dissolved therein from 1 to 10% by weight of a compound of the formula (VII):

$$R^1—X—(OCH_2CH_2)_n—O—CO—(NH)_m—R^2 \quad \text{(VII)}$$

wherein R^1 is alkyl of 1 to 14 carbon atoms, phenyl, phenyl substituted by alkyl of 1 to 12 carbon atoms or alkyl of 1 to 4 carbon atoms substituted by phenyl, R^2 is alkyl of 1 to 14 carbon atoms, phenyl, phenyl substituted by alkyl of 1 to 12 carbon atoms or alkyl of 1 to 4 carbon atoms substituted by phenyl, n is 6 to 100, m is 0 or 1 and X is a bond or —$(NH)_m$—CO—.

4,960,117

REAR ENTRY BOOTH AND SEAT FOR A SIT-DOWN VIDEO GAME

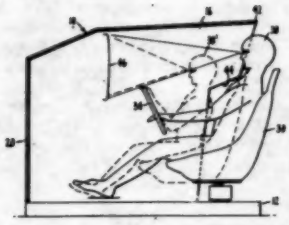
Rick L. Moncrief, Santa Clara, and Erik J. Durfey, Los Gatos, both of Calif., assignors to Atari Games Corporation, Milpitas, Calif.

Filed Jan. 13, 1989, Ser. No. 297,478

Int. Cl.[5] **A63B** *71/00*; **A63F** *7/06*; **G09B** *11/00*

U.S. Cl. 273—148 B **16 Claims**

1. A floor-standing video game player enclosure booth comprising an elevated rectangular base having a front end, a rear end and two sides, the sides being longer than the ends, a front wall affixed to and extending upwards from the front end of the base and two side walls affixed to and extending upwards from the sides of the base and a roof affixed to the upper edges of the front wall and side walls thereby forming an open-at-the-rear booth; a player seat movably mounted to said base said player seat being moveable to a plurality of game-playing positions facing the front wall, said positions varying from one another by being closer to and further from the front wall and thereby adapted for smaller and larger game players and all of said game playing positions being located within the open-at-the-rear booth such that the horizontal field of view of a video game player seated in the seat and looking straight ahead at the front wall is interrupted on at least 180° by the front and side



walls and said player seat also being moveable further to the rear than the rearmost game-playing position to facilitate player entry and exit.

4,960,118

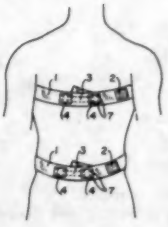
METHOD AND APPARATUS FOR MEASURING RESPIRATORY FLOW

Bernard E. Pennock, 405 Wickford Dr., Pittsburgh, Pa. 15238

Filed May 1, 1989, Ser. No. 345,568

Int. Cl.[5] **A61M** *16/00*

U.S. Cl. 128—200.24 **9 Claims**



1. A method of measuring respiratory air flow comprising the steps of

a. measuring the rate of change of abdomen circumference using an abdominal linear piezoelectric sensor, with said piezoelectric sensor being attached to an extensible abdominal belt by means of at least on non-electrically-conductive rivet, said linear piezoelectric sensor having an electrically-conductive coating on each side thereon, which coating on one side of said linear piezoelectric sensor is removed around said rivet, to provide an electrical output;

b. measuring the rate of change of rib cage circumference using a rib cage linear piezoelectric sensor, with said piezoelectric sensor being attached to an extensible rib cage belt by means of at least one non-electrically-conductive rivet, said linear piezoelectric sensor having an electrically-conductive coating on each side thereon, which coating on one side of said linear piezoelectric sensor is removed around said rivet, to provide an electric output;

c. weighting and summing the outputs of the rib cage and abdominal sensors so that the summed output represents total respiratory flow.

4,960,119

AIRCRAFT AIRCREW LIFE SUPPORT SYSTEMS

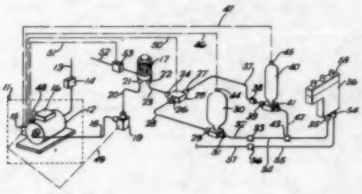
Humphrey A. S. Hamlin, Yeovil, United Kingdom, assignor to Normalair-Garrett (Holdings) Limited, England

Filed May 4, 1989, Ser. No. 347,007

Claims priority, application United Kingdom, May 31, 1988, 8812888

Int. Cl.[5] A62B 7/14, 7/08, 7/02

U.S. Cl. 128—204.18 8 Claims



1. An aircraft aircrew life support system comprising an on-board oxygen generating system (OBOGS 11) for delivering oxygen-enriched breathable gas, compressor means (17) connected for receiving breathable gas delivered by the OBOGS and operable to increase the pressure of said breathable gas, a plenum storage tank (30) connected for receiving breathable gas from said compressor means and further connected for supplying breathable gas for breathing by aircrew during normal flight operations, an emergency breathable gas storage bottle (40) connected for receiving breathable gas from said compressor means and further connected for supplying breathable gas for breathing by aircrew at least during bail-out from the aircraft, valve means (25) connected between said compressor means and said storage tank and storage bottle, said valve means being operable by control means (15) to selectively control breathable gas to flow from the compressor means to charge either the plenum storage tank or the emergency storage bottle.

4,960,120

BREATHING APPARATUS

Trevor Constance-Hughes, Abergavenny, United Kingdom, assignor to Siebe Gorman & Company Limited, Windsor, England

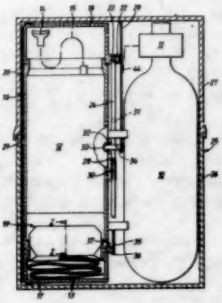
PCT No. PCT/GB88/00097, § 371 Date Nov. 10, 1988, § 102(e) Date Nov. 10, 1988, PCT Pub. No. WO88/06047, PCT Pub. Date Aug. 25, 1988

PCT Filed Feb. 16, 1988, Ser. No. 263,772

Claims priority, application United Kingdom, Feb. 16, 1987, 8703523

Int. Cl.[5] A62B 7/02, 7/10, 9/02

U.S. Cl. 128—205.22 20 Claims



1. Closed-circuit breathing apparatus comprising a breathing bag; a purifier including purifying material for removing carbon dioxide from a life-supporting gas mixture; said purifier being arranged in operation to be in communication with said breathing bag and with a user; means for supplying oxygen to said apparatus; means for permitting gas to pass from the apparatus to the exterior; said apparatus being arranged when brought into use to operate initially with an open circuit where gas exhaled by a user passes to the exterior and the user inhales gas from said oxygen-supplying means; and means responsive to the breathing of the user to cause said apparatus to change after a predetermined number of inhalations to a closed-circuit operation wherein gas inhaled by the user passes to said breathing bag and the user inhales gas from said breathing bag including gas from said oxygen-supplying means.

4,960,121

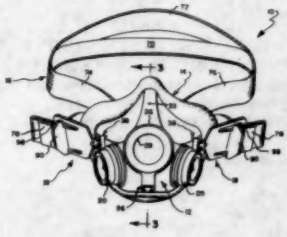
HALF-FACE MASK ASSEMBLY

James E. Nelson, Williamsville, N.Y.; Valentine A. Castro, and Noemi Esparza, both of Pasadena, Calif., assignors to Figgie International, Inc., Willoughby, Ohio

Filed Mar. 18, 1987, Ser. No. 27,567

Int. Cl.[5] A62B 18/08

U.S. Cl. 128—206.24 17 Claims



1. A half-face mask comprising:

a hard shell provided with a U-shaped peripheral edge portion having spaced apart inner and outer legs and a bight portion which defines a channel open to the forward side;

an elastomeric face seal removably secured to said hard shell, the face seal including a U-shaped peripheral edge, a skirt, and face contacting portion, the U-shaped peripheral edge having inner and outer legs and a bight portion which defines a channel open to the rear side, the U-shaped peripheral edge of the face seal being secured to the U-shaped peripheral edge of portion of the hard shell in interlocking relationship, the inner leg of the U-shaped peripheral edge of the face seal being received between the inner and the outer legs of the U-shaped peripheral edge portion of the hard shell, and the skirt having a portion parallel to said U-shaped peripheral edge of the face seal and lying against a back portion of the U-shaped peripheral edge portion of the hard shell, the skirt extending from the face seal around the back of the bight portion and the inner leg of the U-shaped peripheral edge portion, the skirt being in contact with the inner leg of the U-shaped peripheral edge portion of the hard shell; and

head harness means secured to the hard shell for holding the hard shell and face seal onto the face of a wearer.

4,960,122

ENDOTRACHEAL TUBE REPLACEMENT OBTURATOR

Irving Mizus, 4308 47th St. NW., Washington, D.C. 20016

Filed May 6, 1988, Ser. No. 190,974

Int. Cl.[5] A61M 16/00

U.S. Cl. 128—207.14 5 Claims

1. Apparatus for replacing a tracheal tube comprising:

a elongated flexible obturator having a length sufficient to be

inserted in one end of a tracheal tube and protrude through the distal end thereof with an uninserted length protruding from the proximal end, said obturator having a width to permit passage through said tracheal tube and maintain an opening in a patient's trachea following withdrawal of said tracheal tube, said obturator further com-

prising; a cover and a core, said cover made from an elastomer or plastic material, a flexible soft atraumatic tip at an insertion end defined by an elongated tapering solely of said cover and gripping means at an opposite end, and at least one positioning mark to provide a point of reference when one tracheal tube is replaced by another using said obturator as an in-vivo guide.

4,960,123

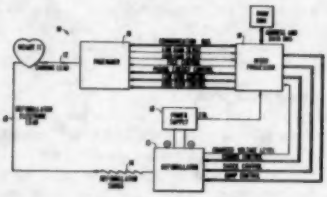
DIFFERENTIATING BETWEEN ARRHYTHMIA AND NOISE IN AN ARRHYTHMIA CONTROL SYSTEM

Philip J. Maker, North Ryde, Australia, assignor to Telectronics N.V., Curacao, Netherland Antilles

Filed Mar. 16, 1989, Ser. No. 324,487

Int. Cl.[5] A61N *1/39*

U.S. Cl. 128—419 D **24 Claims**



1. An apparatus for differentiating between arrhythmia and noise in an antiarrhythmia device comprising: a high gain channel detecting means for noise detection, a low gain channel detecting means for noise detection and for detecting the presence of an arrhythmia when no noise is detected by said high gain channel detecting means, arrhythmia therapy means responsive to said low gain channel detecting means for delivering arrhythmia therapy, and means for applying a noise detection criterion to each of said high and low gain channel detecting means.

4,960,124

DEVICE FOR LOW-FREQUENCY ELECTROTHERAPY

Kazumi Masaki, Osaka, Japan, assignor to Ken Hayashibara, Okayama, Japan

Continuation of Ser. No. 89,952, Aug. 26, 1987, abandoned. This application May 1, 1989, Ser. No. 346,310

Claims priority, application Japan, Aug. 31, 1986, 61-133325

Int. Cl.[5] A61N *1/32*

U.S. Cl. 128—421 **8 Claims**

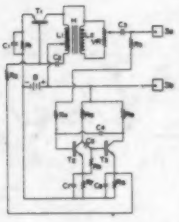
1. A device to effect low-frequency electrotherapy to a subject's body with the body being an electrical load on the device, said device comprising

a direct current source;

a first electrode and a second electrode across which the electrical load of the body is applied during operation of the device;

a first oscillator circuit connected to said direct current source through said first and second electrodes when the electrical load of the body is applied across said electrodes;

said first oscillator circuit having an output connected to an input of a second oscillator circuit to said first electrode, for said first oscillator circuit to generate a low-frequency square wave voltage to the load across said electrodes;



said second oscillator circuit having an output connected to said first electrode to generate a diphasic action potential to the load across said electrodes when the low-frequency square wave voltage g-nerated by said first oscillator circuit is not zero;

said second electrode connected with a return circuit common to said first and second oscillator circuits through said direct current source to actuate said first oscillator circuit only when the load of the body is applied across said electrodes.

4,960,125

DEVICE FOR LOW-FREQUENCY ELECTROTHERAPY IN A HUMID ENVIRONMENT

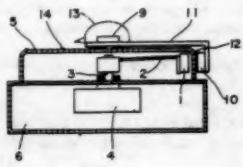
Kazumi Masaki, Osaka, Japan, assignor to Ken Hayashibara, Okayma, Japan

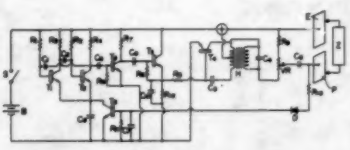
Continuation of Ser. No. 89,954, Aug. 26, 1987, abandoned. This application Oct. 26, 1988, Ser. No. 265,291

Claims priority, application Japan, Aug. 31, 1986, 61-133326

Int. Cl.[5] A61N *1/32*

U.S. Cl. 128—421 **7 Claims**





1. A device to effect low-frequency electrotherapy in a humid environment, comprising:

an electrode that acts as a dispersive electrode when in use;

another electrode that acts as an active electrode when in use;

a transistorized multivibrator generating a positive square wave with a pulse interval of 0.1–10 seconds and a pulse width of 0.1–10 seconds when a load is connected between the electrodes;

a transistorized blocking oscillator generating a diphasic action potential with a frequency of 10–300 hertz, said

diphasic action potential having a spike in respective voltage components in positive and negative directions and said blocking oscillator having an output terminal connected with said active electrode;

a transistorized saturating circuit having an input terminal connected with an output terminal of said multivibrator, and also having an output terminal connected with a base of said transistorized blocking oscillator;

a battery means to energize the whole circuit; and

a variable resistor connected between the output terminal of said blocking oscillator and said active electrode, said variable resistor comprising;

a resistive element;

a sliding member slidable along with said resistive element;

a moisture proof container enclosing said resistive element and sliding member; and

a guide member attached outside said container, said guide member is movable magnetically in association with said sliding member.

4,960,126

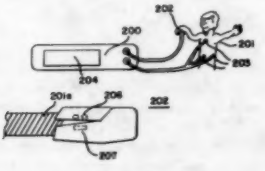
ECG SYNCHRONIZED PULSE OXIMETER

Brendan Conlon, Elm Grove; James A. Devine, and James A. Dittmar, both of Waukesha, all of Wis., assignors to Criticare Systems, Inc., Waukesha, Wis.

Continuation of Ser. No. 144,913, Jan. 15, 1988, abandoned. This application Oct. 14, 1988, Ser. No. 259,446

Int. Cl.[5] A61B *5/02*

U.S. Cl. 128—633 **15 Claims**



1. An improved method for determining the oxygen saturation level of a patient's blood, comprising the steps of:

(a) optically measuring the patient's arterial blood flow so as to produce a series of optical pulses which are a measure of arterial pulses as well as patient motion and other artifact;

(b) detecting the arterial heartbeat of the patient;

(c) averaging a series of optical pulses within a time frame determined by the arterial heart-beat to derive an average optical pulse; and

(d) determining the oxygen saturation level of the blood based upon the average optical pulse.

4,960,127

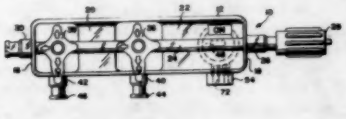
DISPOSABLE TRANSDUCER MANIFOLD

Louis O. Noce, and Michael Basta, both of Longwood, Fla., assignors to L.O.N. Research, Inc., Sanford, Fla.

Filed Jan. 23, 1989, Ser. No. 299,500

Int. Cl.[5] A61B *5/02*

U.S. Cl. 128—675 **25 Claims**



1. A disposable transducer manifold assembly for fluid pressure monitoring comprising:

an elongated manifold frame;

a hollow, elongated tubular manifold formed within and at least coextensive with said frame and having an inlet end for receiving fluid directly from a patient, an outlet end for returning said fluid to the patient and a substantially axial passageway extending between said inlet and outlet ends;

at least one valve port and at least one sensing port provided in the tubular manifold intermediate said inlet and outlet ends, and opening into said passageway;

a pressure sensing transducer mounted within a housing at least partially molded into said manifold frame adjacent said sensing port, a sensing surface of said transducer adapted for direct exposure to fluid flowing through said passageway across said sensing port; and

electrical connector means extending from said pressure sensing transducer to a monitor.

4,960,128

METHOD AND APPARATUS FOR CONTINUOUSLY AND NON-INVASIVELY MEASURING THE BLOOD PRESSURE OF A PATIENT

Deborah C. Gordon, Woodside, and Frank A. Brunot, Livermore, both of Calif., assignors to Paramed Technology Incorporated, Mt. View, Calif.

Filed Nov. 14, 1988, Ser. No. 270,224

Int. Cl.[5] A61B *5/02*

U.S. Cl. 128—677 **13 Claims**

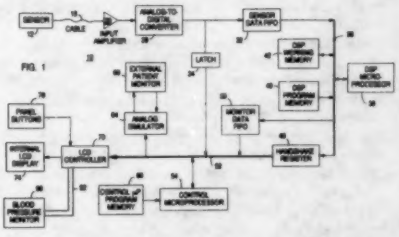


FIG. 1

1. An instrument for non-invasively measuring the blood pressure of a patient, said instrument comprising:

non-invasive sensor means for measuring the frequencies and displacements of an arterial wall of said patient, and for generating a first signal in response thereto;

means for processing said first signal to produce a processed first signal, said processing means comprising:

means for filtering said first signal to produce a filtered first signal;

programmable gain means for amplifying said filtered first signal to produce an amplified first signal;

digitizing means for digitizing said amplified first signal to produce a digital first signal; and

fourier transform means for transforming said digital first signal into said processed first signal, said instrument further comprising:

means for receiving a calibration signal indicative of the absolute blood pressure of said patient at a particular point in time;

means for storing said processed first signal corresponding to said particular point in time; and

means for comparing said processed first signal to said stored processed first signal and for generating a signal indicative of the blood pressure of said patient, said comparing means comprising:

means for subtracting said processed first signal from said stored processed first signal and for generating a scale factor and an offset in response thereto;

means for adjusting said integrating said first signal from said sensor means to produce an integrated signal; and

means for adjusting said integrated signal by said scale factor and said offset to generate said signal indicative of the blood pressure of said patient.

4,960,129

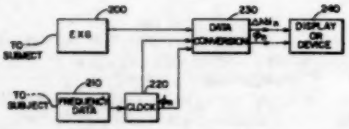
METHODS OF OBSERVING AUTONOMIC NEURAL STIMULATION AND DIAGNOSING CARDIAC DYNAMICAL DYSFUNCTION USING HEARTBEAT INTERVAL DATA TO ANALYZE CARDIOVENTILATORY INTERACTIONS

Robert dePaola, Philadelphia, Pa., and Stellan Ostlund, Coral Gables, Fla., assignors to Trustees of the University of Pennsylvania, Philadelphia, Pa.

Filed Dec. 5, 1988, Ser. No. 280,138

Int. Cl.[5] A61B *5/02*

U.S. Cl. 128—695 **20 Claims**



1. A method of determining the occurrence of a neural stimulus to a cyclic physiological function which occurs in a subject, comprising the steps of:

(a) determining the time interval between successive heartbeats of said subject and generating data representative of said time intervals;

(b) determining the phase of said cyclic physiological function over a predetermined interval concurrent with said time interval determination, said interval having a duration of more than one heartbeat, and generating data representative of said phase;

(c) combining said heartbeat interval and physiological phase data as a data set;

(d) processing said data set to identify pronounced variations in said heartbeat interval data within a portion of said cycle of said physiological function;

whereby the presence of said repetitive pronounced variation is indicative of the occurrence of neural stimulus.

4,960,130

MODULAR FLUID SAMPLE PREPARATION ASSEMBLY

Raouf A. Guirguis, Gaithersburg, Md., assignor to Cancer Diagnostics, Inc., Rockville, Md.

Division of Ser. No. 308,763, Jan. 10, 1989. This application Nov. 14, 1989, Ser. No. 435,805

Int. Cl.[5] A61B *5/00*

U.S. Cl. 128—760 **12 Claims**

1. An apparatus for collecting biological fluids and holding a predetermined sample for testing comprising a tubular container having open ends; a collection storage unit removably secured to one of said container ends, said collection storage unit having an open end and a closed end, a shuttle assembly slidably mounted in said tubular container, said shuttle assembly comprising a cylindrical hollow piston defining a chamber, a testing means mounted in said piston chamber, a top cover covering one end of said piston and fluid flow means formed on the other end of said piston, said fluid flow means comprising an end member with a connector means mounted therein, said connector means defining a throughgoing bore communicating with said piston chamber, "O" ring means mounted on the exterior surface of said piston to form a fluid tight seal between said "O" ring means and the interior surface of said elongated tubular container, and sample container means removably secured to said connector means and adapted to be seated in said collection storage unit.

4,960,131

PENIS ERECTION TESTING AND MEASURING DEVICE

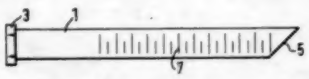
Walter Koss, Industriestrasse, D-6222 Geisenheim/Rhein, Fed. Rep. of Germany

Continuation of Ser. No. 491,270, May 4, 1983, abandoned. This application Apr. 19, 1988, Ser. No. 183,524

Claims priority, application Fed. Rep. of Germany, May 6, 1982, 8213060[U]

Int. Cl.[5] A61B *5/03*

U.S. Cl. 128—774 **26 Claims**



1. A device for testing and measuring the extent and the force of penis erection, comprising a band having first and second ends which is adapted to be fitted on the shaft of the penis in an encircling relationship therewith; a slider member secured to said first end of said band which insertably receives said second end of said band therethrough, so that said band encircles the penis; and means for retarding the sliding movement of said band through said slider member; wherein said retarding means provides a predetermined resistance to said sliding movement corresponding to a specific force of penis expansion.

4,960,132

SELF-CONTAINED PERIODONTAL PROBE FOR REMOTE RECORDATIONS

Charles F. Habekost, 463 Curie Dr., San Jose, Calif. 95123

Filed Sep. 5, 1989, Ser. No. 403,108

Int. Cl.[5] A61B *5/10*

U.S. Cl. 128—776 **17 Claims**

1. An apparatus for determining the depth of an anatomical pocket of a patient comprising,

a hand-held probe body defining a longitudinal passage therein,

a movable fiber slidably received within said passage, a pocket-entering end of said fiber extending in a reciprocating manner to the exterior of said probe body,

transducer means operatively coupled to said fiber for generating a signal having a characteristic related to the depth of an anatomical pocket as determined by the measure of

one of the relative position and the relative movement of said pocket-entering end and said probe body, and

finger-actuated means structurally associated with said probe body for selectively transmitting said signal in a wireless fashion to a remote receiver, said finger-actuating means including a transmitter and an actuation circuit, said actuation circuit having means for actuating said transmitter upon sensing of a change of capacitance associated with said probe body,

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4,960,133

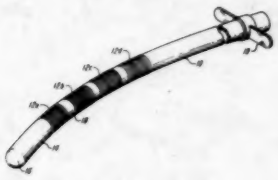
ESOPHAGEAL ELECTRODE

Carl E. Hewson, Marshfield, Mass., assignor to Brunswick Manufacturing Co., Inc., Wareham, Mass.

Filed Nov. 21, 1988, Ser. No. 273,928

Int. Cl.[5] A61N *1/00*

U.S. Cl. 128—784 **16 Claims**



1. An esophageal electrode comprising a flexible tube sized to be inserted through the nose or mouth into the esophagus of a patient,

and a plurality of contact rings each approximately 15 mm long embedded in the outer surface of the tube and spaced apart axially approximately 6 mm.

4,960,134

STEERABLE CATHETER

Wilton W. Webster, Jr., 5114 Commerce Dr., Baldwin Park, Calif. 91706

Filed Nov. 18, 1988, Ser. No. 273,048

Int. Cl.[5] A61N *1/00*

U.S. Cl. 128—786 **12 Claims**

1. A steerable catheter comprising:

a flexible, elongated catheter body having proximal and distal ends and a first lumen;

a flexible catheter tip fixedly attached to the distal end of the catheter body, said tip comprising a second lumen, the axis of the second lumen being offset from the axis of the tip;

a control handle at the proximal end of the catheter body, said control handle comprising:

a housing having proximal and distal ends and a piston chamber at its distal end;

a piston having proximal and distal ends and a longitudinal bore therethrough mounted in the piston chamber of the housing and moveable longitudinally within the piston chamber, wherein the proximal end of the catheter body is fixedly attached to the distal end of the piston; and

means proximal to the piston, for securing the proximal end of a puller wire to the housing;

an elongated puller wire having a proximal end fixedly attached to the securing means at a location proximal to the piston chamber, said puller wire extending through the bore of the piston, the first lumen of the catheter body and into the second lumen of the catheter tip, said puller wire further comprising a distal end fixedly attached to the catheter tip; and

whereby longitudinal movement of the piston relative to the housing results in deflection of the catheter tip.

4,960,135

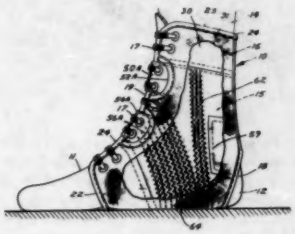
ANKLE RESTRAINT DEVICE

Ronald E. Nelson, 405 Sunset La., Cambridge, Minn. 55008

Filed Jan. 19, 1989, Ser. No. 298,697

Int. Cl.[5] A61F *5/00*

U.S. Cl. 128—80 H **18 Claims**



1. An ankle restraint device to be worn on the lower leg, ankle and foot, comprising:

an outer brace formed of flexible sheet-like material configured to conform to the lower leg, ankle and mid-foot, said outer brace having a top edge that wraps around the lower leg, said top edge having ends that come toward one another forming a leg opening to the outer brace, a bottom edge that wraps around the mid-foot area, said bottom edge having ends that come toward one another on the upper foot surface to form a foot opening, and first and second forward edges extending between the ends of the top edge and the bottom edge adapted to extend toward one another around the front superior foot surface, and means for fastening the first and second forward edges with respect to one another to place the outer brace in tension around the lower leg, ankle and mid-foot, said outer brace being comprised of inner and outer layers of flexible sheet-like material joined together at said top, bottom and forward edges forming inner and outer side walls disposed in substantially co-extensive relationship at least in the region of the ankle, lower leg, and mid-foot;

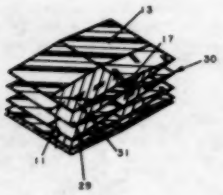
an inner ankle brace installed between the inner and outer side walls of the outer brace, said inner brace having medial and lateral side walls for disposition in generally covering relationship to the medial and lateral sides of the ankle, said inner brace having a top edge that wraps around the lower leg, said top edge having ends that come toward one another forming a leg opening disposed beneath the leg opening of the outer brace, a bottom edge that wraps around the mid-foot area, said bottom edge having ends that come toward one another to form a foot opening located rearwardly of the foot opening of the outer brace, and first and second forward edges extended between the top and bottom edges, said first and second forward edges having forwardly extended arms, said side walls of the outer brace having arm openings proximate the outer brace forward edges for extension of the ends of said arms of the inner brace on the medial and lateral sides, the ends of said arms on the inner brace extended through the arm openings of the outer brace, and means for fastening the ends of the arms with respect to one another to place the inner brace in tension around the lower leg, ankle and foot independently of the outer brace.

4,960,136

FOLDED DISPOSABLE DECONTAMINATION UNIT

Thomas Linnemann, Holland, and Kurt Linnemann, Hatboro, both of Pa., assignors to Radiation Management Consultants, Inc., Philadelphia, Pa.

Filed Apr. 10, 1989, Ser. No. 335,825
Int. Cl.[5] A61G 7/00
U.S. Cl. 128—845 6 Claims



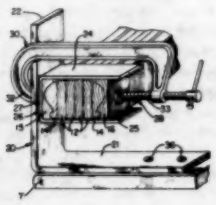
1. A disposable decontamination device comprising a foldable frame expandable to define a rectangular shape sized to accommodate a patient, said frame being a collapsible, pleated, expandable, disposable frame having side and end portions extending vertically and parallel to form an expanded rectangular enclosure large enough to accommodate a patient, said side and end portions consisting of a plurality of panels pleated relative to one another to permit unfolding of said frame to an expanded position forming said expanded enclosure, said frame including bottom tabs extending from said side and end portions and folding inwardly relative to said side and end portions into said rectangle and parallel to said rectangle when said frame is expanded to stabilize said frame in said rectangular position forming a basin and a flexible fluid resistant liner forming a collection basin with drain means for transferring fluid from said disposable device and sized to enclose said frame when positioning a patient therein.

4,960,137

METHOD AND APPARATUS FOR FORMING CURVED HANDRAILS

Ronald W. Pott, Lakewood, and William G. Grimm, Evergreen, both of Colo., assignors to R.W. Investment Co., Commerce City, Colo.

Filed Aug. 28, 1989, Ser. No. 400,868
Int. Cl.[5] B27D 1/00
U.S. Cl. 144—349 13 Claims



1. The method of compound bending of laminated wooden beam members into a curved rail section comprising the steps of:

assembling elongated strips of wood of a predetermined length in juxtaposed relation to one another;

positioning upstanding support members at longitudinally spaced intervals along the path of intended curvature;

applying adhesive between said strips and securing said strips together in juxtaposed relation to one another;

positioning retaining members on said support members to engage top and bottom edges of said elongated strips whereby to prevent twisting of said strips when a lateral force is applied;

clamping said strips and each said retaining member laterally against each said support member so as to apply pressure uniformly across the transverse dimension of said strips; and

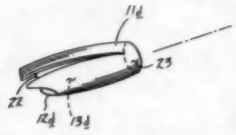
curing said strips together into a curved rail section.

4,960,138

FINGERNAIL PROTECTIVE DEVICE

Tamara L. Kling, 120 Michigan, Box 466, Hartford, Mich. 49057

Filed Jun. 27, 1989, Ser. No. 371,840
Int. Cl.[5] A45D 29/00
U.S. Cl. 132—73 1 Claim



1. A fingernail protective device comprising:

an elongate tubular member defined about a central axis and the tubular member including an upper convex surface with a rear terminal edge overlying and extending beyond an underlying rear terminal edge of a bottom surface, and

the tubular member formed of a flexible, porous gelatin to allow breathing of said tubular member and to afford protection to a natural fingernail, said tubular member surroundingly secured to said natural fingernail and

said upper convex surface includes a V/shaped slot originating at a rear terminal edge of the upper convex surface said slot provided for enhancing reception of an adhesive, and

said tubular member further including a frontal aperture formed through a forward portion of the tubular member said frontal aperture coaxially aligned with the central axis of said tubular member.

4,960,139

WATER FLOW DISTRIBUTOR FOR A WASHING MACHINE

Pietro Rizzetto, Venezia, Italy, assignor to Industrie Zanussi SpA, Pordenone, Italy

Filed Sep. 27, 1989, Ser. No. 413,390
Claims priority, application Italy, Sep. 30, 1988, 34046/88[U]
Int. Cl.[5] D06F 39/02
U.S. Cl. 137—625.46 15 Claims

1. A water distributing device for a washing machine for flushing chemical additives from a chemical additive dispenser of the washing machine, comprising:

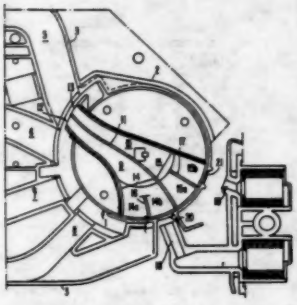
a first supply conduit for connection to a main water supply for providing a supply of hot water;

a second supply conduit for connection to a main water supply for providing a supply of cold water;

a plurality of distributing conduits for distributing water to flush respective chemical additives from the chemical additive dispenser;

a water distributing means for selectively connecting said

first and said second supply conduits with said plurality of distributing conduits, said water distributing means com-



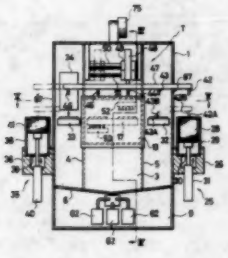
prising a single element having a plurality of water flow channels therethrough.

4,960,140

WASHING ARRANGEMENT FOR AND METHOD OF WASHING LEAD FRAMES

Akira Ishijima; Toshihiko Beppu, and Gunpei Kikuchi, all of Tokyo, Japan, assignors to Ishijima Industrial Co., Ltd. and Ebara Corporation, both of, Japan

Filed Nov. 27, 1985, Ser. No. 803,105
Claims priority, application Japan, Nov. 30, 1984, 59-251968
Int. Cl.[5] B08B 5/00
U.S. Cl. 134—31 **19 Claims**



1. An arrangement for removing burrs of moldable substances from upper and lower major surfaces of lead frames on portions on which the burrs were undesirably applied during molding, said arrangement comprising:

(a) washing means, including a washing workstation, for directing washing fluids under pressure to upper and lower major surfaces of lead frames within the washing workstation, said washing workstation having a closeable washing chamber bounded by walls, one of said walls being movable between a closed position in which said washing chamber is closed and an open position in which said washing chamber is open, wherein the washing means include holder means for holding the lead frames within the washing workstation, said holder means including at least one holder mounted on said one movable wall for joint movement therewith;

(b) means for moving said one movable wall between said open and closed positions in which the washing chamber is opened and closed, respectively;

(c) supply means, including a supply workstation, for successively supplying burr-bearing frames to the washing workstation;

(d) dryer means, including a drying workstation, for successively drying the lead frames washed by the washing means;

(e) discharge means, including discharge workstation, for successively discharging the lead frames dried by the dryer means; and

(f) transfer means conveying the lead frames along a path through the workstation, said transfer means being at all times located outside the closed washing chamber and being mounted and operative to convey each lead frame from the supply workstation to and from the washing workstation when said one movable wall is situated in said open position and to successively convey each lead frame after washing through the drying workstation and to the discharged workstation;

wherein said moving means constitute means for reciprocally moving said entire wall between said open and closed positions in a direction both substantially perpendicular to said path of the lead frames through said workstations and substantially perpendicular to a face of said wall;

said washing chamber comprises at least one lateral fixed wall extending in a direction substantially perpendicular to said path of travel;

said transfer means are mounted to be reciprocal toward and away from said path of travel, constitute means for transferring each individual frame through the workstations by contact with the same, and include a plurality of suction nozzles, one for each lead frame, and means for lowering each suction nozzle into engagement with a respective lead frame in a workstation, for thereupon lifting each engaged suction nozzle to raise the respective lead frame, for thereupon shifting each raised suction nozzle downstream along the path to the next workstation, and for thereupon lowering each shifted suction nozzle into the next workstation to constitute an operating cycle; and

wherein the said transfer means are mounted to repeat the operating cycle to convey the lead frames consecutively through the workstations.

18. A method of removing the burrs of moldable substances from upper and lower major surfaces of lead frames on portions on which the burrs were undesirably applied during molding, comprising the steps of:

(a) directing washing fluids under pressure in a washing workstation having a closeable washing chamber to upper and lower major surfaces of lead frames therein;

(b) moving a movable wall bounding the closeable washing chamber of the washing workstation between open and closed positions in which the washing chamber is opened and closed, respectively, wherein holder means for holding the lead frames within the washing workstation include at least one holder mounted on the movable wall for joint movement therewith;

(c) successively supplying burr-bearing lead frames from a supply workstation to the washing workstation;

(d) successively drying in a drying workstation the lead frames washed during the washing step;

(e) successively discharging in a discharging workstation the lead frames dried during the drying step; and

(f) conveying the lead frames along a path through the workstation, and conveying each lead frame from the supply workstation to and from the washing workstation in the open position of the one movable wall, and successively conveying each lead frame, after the washing step, through the drying workstation and to the discharged workstation, said conveying step being performed by a transfer assembly at all times located outside the closed washing chamber and away from the hot and humid environment therein;

wherein said entire movable wall is reciprocally moved between said open and closed positions in a direction both substantially perpendicular to said path of the lead frames through said workstations, and substantially perpendicular to a face of said wall; and

the transfer assembly is mounted above the path of travel for

reciprocal up and down movement away and toward the path of travel.

4,960,141

DEVICE FOR CLEANING IN PARTICULAR OF DISC-SHAPED OXIDE SUBSTRATES

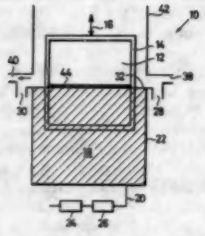
Norbert Lenck, Rodenbach, and Jörg Wörner, Grosskrotzenburg, both of Fed. Rep. of Germany, assignors to Nukem GmbH, Hanau, Fed. Rep. of Germany

Filed Sep. 27, 1988, Ser. No. 249,986

Claims priority, application Fed. Rep. of Germany, Oct. 6, 1987, 3733670

Int. Cl.[5] B08B *7/04*

U.S. Cl. 134—61 **6 Claims**



1. A device for cleaning a disc-shaped substrate such as glass, comprising:

a container holding a water quantity for cleaning said substrate, said container having an overflow for maintaining the surface of said water quantity at an essentially constant level, irrespective of immersion of said substrate in said water quantity;

a water supply connected to said container for feeding water thereto;

a holder adapted to extract said substrate substantially-vertically out of said water quantity;

heating elements arranged above said water quantity and spaced apart to allow said substrate to pass therebetween; and

an air feed arranged above said water quantity for flowing air along said substrate.

4,960,142

PAINT CLEANING APPARATUS

Richard A. Robb, West Bloomfield, Mich., and Michael J. Grubb, London, Canada, assignors to Herrules Equipment Corporation, Walled Lake, Mich.

Continuation of Ser. No. 135,911, Dec. 21, 1987, abandoned. This application May 26, 1989, Ser. No. 358,529

Int. Cl.[5] B08B *3/02*

U.S. Cl. 134—138 **10 Claims**

1. A paint removal system for cleaning paint from objects such as a paint can and its lid comprising:

a housing defining a work chamber;

a manifold adapted to receive pressurized cleaning solvent;

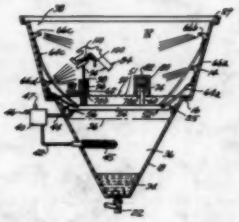
means for supporting the object to be cleaned within the work chamber including:

first conduit means in fluid communication with a first outlet of the manifold;

at least one spray nozzle for spraying cleaning solvent on the lid;

first bracket means for securing the lid, and rotatable about an axis including a central member and a plurality of outwardly extending ribs;

means fitted to the ribs for engaging the peripheral outer edge of the object including bias means, supported completely on one of the ribs including means, movable in a first direction for resiliently engaging the peripheral



edge of the lid and for biasing the lid into the engaging means associated with the other ribs.

4,960,143

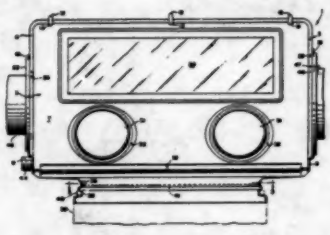
CONTAINMENT APPARATUS

Arthur M. Dore, Jr., and Robert M. Sutherland, both of Bay City, Mich., assignors to Aerospace America, Inc., Bay City, Mich.

Filed Feb. 12, 1988, Ser. No. 155,579

Int. Cl.[5] B08B *3/02*

U.S. Cl. 134—199 **16 Claims**

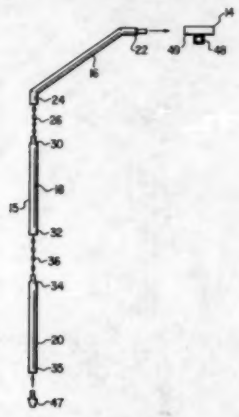


16. Containment apparatus mounted upon an elongate pipe having strippable material thereon, said apparatus comprising a form stable housing movable longitudinally along said pipe, said housing having a length less than that of said pipe and having aligned openings therein at its opposite ends through which said pipe slideably extends, said openings being in communication with one another via a continuous slot in said housing; a pair of resilient and deformable seal members carried by said housing on opposite sides of said slot and normally abutting one another to seal said slot but enabling an attachment on said pipe to pass through said slot as said housing moves along said pipe, said housing having a discharge outlet between its ends; a resilient, annular, deformable cuff carried by said housing at each end thereof and accommodated in the associated opening in position to confront and bear upon said pipe and the material thereon and form an occlusion between said material and said housing at said opening, each of said cuffs having a radial slit extending therethrough in register with that portion of said slot which is adjacent the associated opening, said housing having at least one inlet therein between said ends to which a sleeve may be attached in sealing relation to permit access to the interior of said housing while the latter is mounted on said pipe and thereby enable said material between said ends to be stripped from said pipe, at least one of said cuffs being of such thickness and deformability as to form an occlusion between said housing and said pipe following the stripping of said material from said pipe; and means for separably securing to said housing a pouch in communication with the interior of said housing via said discharge outlet.

4,960,144
PORTABLE BLIND

E. Durwood Wheatley, and Elaine P. Wheatley, both of Wichita Falls, Tex., assignors to Porta-Blind, Inc., Wichita Falls, Tex.

Continuation of Ser. No. 123,947, Nov. 23, 1987, abandoned.
This application Jun. 23, 1989, Ser. No. 371,665
Int. Cl.[5] E04H *15/34*
U.S. Cl. 135—101 19 Claims



1. A portable blind comprising:

a cross-member, said cross-member having two channel members, each said channel member having an aperture formed at its end;

four leg members, each of said leg members comprising:

an upper frame section having a proximal end and a distal end, said proximal end of said upper frame section constructed to slidably engage one of said apertures of said channel members;

a first tension spring means having a proximal end and a distal end, said proximal end of said first tension spring means disposed on said distal end of said upper frame member;

a middle frame section having a proximal end and a distal end, said distal end of said first tension spring means being disposed on said proximal end of said middle frame section, said proximal end of said middle frame section constructed to slidably engage said distal end of said upper frame member;

a second tension spring means having a proximal end and a distal end, said proximal end of said second tension spring means disposed on said distal end of said middle frame section;

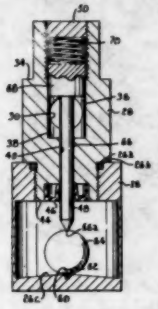
a lower frame section having a proximal end and a distal end, said distal end of said second tension spring means being disposed on said proximal end of said lower frame section, said proximal end of said lower frame section constructed to slidably engage said distal end of said middle frame section; and

a canopy, said canopy comprising a single piece of waterproof tent material having four side panels and one top panel, said piece of tent material arranged to substantially cover said cross-member and said leg members, one of said side panels defining a window opening therein, said side panel defining said window opening having a loop formed thereon at the lower edge of and across the width of said window opening defined in said side panel, and a reinforcement dowel having a length substantially equivalent to the width of said window opening, said dowel being dimensioned whereby said dowel can be removably disposed within said loop.

4,960,145
FUEL SHUT-OFF VALVE

Robert A. Schlotzhauer, 12907 Meadowlark, Lee's Summit, Mo. 64063

Filed Apr. 25, 1989, Ser. No. 343,042
Int. Cl.[5] F16K *17/36*
U.S. Cl. 137—38 1 Claim



1. A valve in a vehicular fuel line for automatically closing the fuel line in the event of a collision, said valve comprising:

a valve body on the fuel line presenting a passage therein accommodating flow of fuel when open, said valve body being hermetically sealed to seal and shield internal components thereof;

a valve plug mounted within said valve body for linear movement from an open position wherein said passage is open and a closed position wherein said passage is closed and flow through the fuel line is blocked;

spring means for urging said plug toward the closed position;

a relatively massive ball in said valve body;

a rigid surface in said valve body presenting a seat on which the ball normally seats in a manner to resist unseating due to vertical forces but to allow unseating of the ball due to horizontally applied forces above a preselected magnitude indicative of a collision, said surface being oriented generally horizontally but sloping downwardly in all directions away from said seat to effect rolling of the ball away from the seat when unseated therefrom; and

a stem extending from said valve plug and having a tip engaged against the ball when same is on said seat to maintain the plug in its open position, said stem releasing from the ball when same is unseated to then allow movement of the plug to its closed position under the influence of said spring means.

4,960,146
EARTHQUAKE SAFETY VALVE

Antone W. Morris, P.O. Box 208, Point Reyes, Calif. 94956

Filed Apr. 26, 1990, Ser. No. 514,762
Int. Cl.[5] F16K *17/36*
U.S. Cl. 137—39 5 Claims

1. A shock sensitive self-closing safety valve for a gas pipeline comprising:

a valve body of a non-magnetic material having inlet and outlet flow passageways with an annular, generally horizontal valve seat between them;

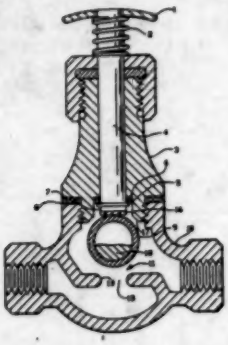
a valve element of a magnetic material above said valve seat;

a permanent magnet in the shape of a valve stem in said valve body above said valve element and movable therein toward and away from said valve element to engage and suspend same above said valve seat;

spring means biasing said magnet away from said valve element; and

a spacer gap of a non-magnetic material secured to the bot-

tom of said magnet to establish the magnetic gap between said magnet and said valve element with said valve element to enable horizontal movement of said valve element while suspended by said magnet.



4,960,147

VIBRATION ACTIVATED RELIEF VALVE

Harvey E. Diamond, 6518 Ellenview Ave., West Hills, Calif. 91307

Continuation-in-part of Ser. No. 155,515, Feb. 12, 1988, Pat. No. 4,821,759. This application Apr. 17, 1989, Ser. No. 339,149

The portion of the term of this patent subsequent to Apr. 18, 2006, has been disclaimed.

Int. Cl.[5] F16K *17/36*

U.S. Cl. 137—45 **11 Claims**

1. A shock actuated shut-off valve comprising:

a valve, having an open position and a closed position, rotatably mounted within a valve body;

a valve stem connected to the valve;

an elongated handle connected to the valve stem engagement end and having a ball detent engagement end;

means for urging said valve to rotate into the closed position;

means for stopping further rotation of the valve when the valve is in the closed position;

a ball detent having:

a ball detent housing;

a ball disposed within the ball detent housing;

a movable ball support for urging said ball upwardly;

a spring member for urging said movable ball support upwardly relative to said ball detent housing;

a pendulum having a ball detent engagement end and a plumb end, said pendulum responding to a shock by freeing the ball detent, thereby allowing the valve to move to the closed position.

4,960,148

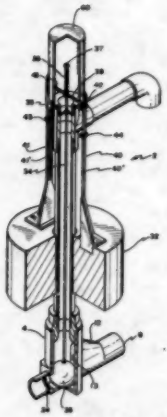
IRRIGATION SYSTEM

Saleh A. Al-Hamlan, P.O. Box 19200 Khaitan, Khaitan, Kuwait (83803)

Filed Dec. 27, 1989, Ser. No. 457,870

Int. Cl.[5] F16K *31/20*

U.S. Cl. 137—122 **6 Claims**



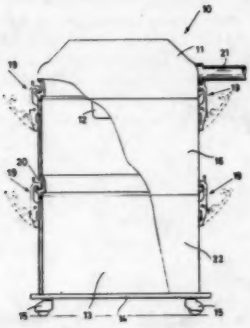
1. An irrigation system for use with a pressurized source of water comprising a hollow valve housing which defines an upwardly extending hollow cylindrical portion having a first annular outlet in an upper portion thereof, said housing also defining an inlet in a lower portion thereof for connecting said housing to the pressurized source of water, said housing further defining a second annular outlet in the lower portion thereof, a ball-shaped gate member disposed within said housing and adapted to move upwardly and downwardly within said cylindrical portion, and seat means associated with each of said outlets and adapted for receiving said ball-shaped gate member therein and thereagainst for closing each of said outlets, means for defining a pit, and float means disposed in said pit, an upwardly-extending pipe connected to said first outlet and extending above said pit, outlet means in an upper portion of said upwardly-extending pipe so that when said ball-shaped gate member is in a first position against said seat means associated with said second outlet to thereby close said second outlet, water from the pressurized source flows through said inlet, said housing, said first outlet and said upwardly extending pipe and out of said outlet means to fill said pit, a rod connected to said gate member and extending upwardly through said upwardly-extending pipe, and a spring having a first portion fixed to said rod, and a displaceable spring biasing member engaging a second portion of said spring, so that, movement of said spring biasing member with respect to said rod changes a force which is exerted against said rod by said spring, and means connecting said spring biasing member and said float so that the upward movement of said float in response to an increase in the water level in said pit is transferred to said spring biasing member to thereby increase the force on said rod until such force exceeds the force of the flow of water against said ball-shaped gate member whereupon the ball-shaped gate member spring out of said seat means which is associated with said second outlet and upwardly into engagement with said seat means which is associated with said first outlet to thereby close said outlet and direct the flow of water through said second outlet.

4,960,149

ASPIRATOR FOR LIQUID AND SOLID SUBSTANCES, WITH SECTIONAL STORAGE BIN

Gilberto Rizzitiello, Milan, Italy, assignor to F.A.D.I. Fabrica Aspirapolvere Domestic Industriali, Milan, Italy

Filed Jul. 24, 1989, Ser. No. 383,716
Int. Cl.[5] B65D 6/00; A47L 5/00
U.S. Cl. 137—205 **2 Claims**



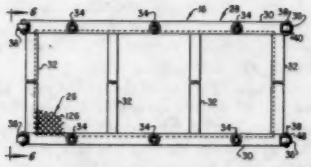
1. In an aspirator for solid and liquid substances, of the type comprising a head supporting thereon an electric motor-driven suction device, said head being removably fitted onto the open upper end of a wheel-mounted bin, and a suction hose communicating with the inside of said bin, the improvement characterized by the fact that said bin comprises a bottom section carrying wheels on its undersurface, one or more intermediate sections, open from above and below, and stacked and removably secured together and to said bottom section, and coupling means for releasably connecting said sections together to form said bin, a plurality of latching notches formed in said head and said intermediate sections, and said coupling means being in the form of a plurality of fasteners, disposed externally of and adjacent to one edge of each of said sections, and each of said fasteners being movable from a first open position to a second closed position by fitting into a corresponding one of said notches in said intermediate sections and said head, respectively.

4,960,150

MOVABLE SAFETY COVER FOR VEHICLE SERVICE PIT

Alex Ryan, 3104 Oakdale Ct., Hurst, Tex. 76054

Filed Jun. 30, 1989, Ser. No. 373,589
Int. Cl.[5] B60S 3/04
U.S. Cl. 137—234.6 **20 Claims**



1. A movable safety cover apparatus for covering an elongated opening in a floor, comprising in combination:

(a) a plurality of deck carriers positioned adjacently and supported on each elongated side of said opening by a respective carrier track wherein a side member on each side of said carrier member is in surface-to-surface frictional contact with a respective carrier track;

(b) a roller member mounted at each end of each of said side members in a position slightly out of contact with a respective carrier track when said side members are in said frictional contact and in position for engaging said track in rolling relation when one end of said deck carrier is lifted up slightly from said frictional contact;

(c) a plurality of low profile rolling transfer members mounted on top of each of said side members to permit each deck carrier to roll across the top of an adjacent deck carrier;

(d) each said roller member being mounted to extend slightly above the bottom of each said side member to permit each side of an adjacent deck carrier to roll when said adjacent carrier is lifted up at one end to engage its roller members into rolling engagement with said track and is pushed while lifted to place the bottoms of said adjacent side members on top of adjacent roller members; and

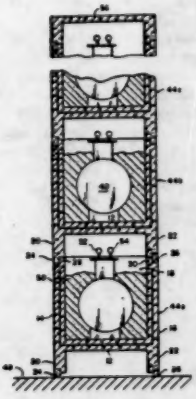
(e) wherein said adjacent deck carrier may be rolled up said roller members then tilted to horizontal to roll on said rolling transfer members.

4,960,151

SYSTEM FOR STORING A HAZARDOUS LIQUID

Frank Kaminski, Churchville, and Earl J. Schiffhauer, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 6, 1989, Ser. No. 432,280
Int. Cl.[5] F16L 3/12
U.S. Cl. 137—376 **5 Claims**



1. A system for storing hazardous liquids comprising:

a plurality of substantially identical modules, each module comprising a leak tight prefabricated vessel and a liquid storage tank mounted within the vessel,

a fire retardant material within each vessel and around each tank,

a support at or above grade for supporting the modules,

a first one of the modules being mounted on the support,

a second one of the modules being removably mounted on top of the first module, and

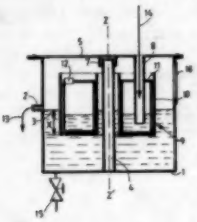
each of the vessels having a bottom wall and legs that hold the bottom wall above the support or a lower module so that there is a space below the bottom wall that can be inspected to determine if the module is leaking liquid.

4,960,152

DEVICE FOR COMPENSATING BY SUPPLYING A MEASURED AMOUNT OF FLUID AND ITS APPLICATION FOR REPLENISHING A HYDRAULIC CIRCUIT

Philippe Hubert, Lyons, and Eric Martin, Villeurbanne, both of France, assignors to Novatome, Courbevoie, France

Filed May 8, 1989, Ser. No. 348,529
Claims priority, application France, May 6, 1988, 88 06169
Int. Cl.[5] F16K *21/18, 37/00*
U.S. Cl. 137—559 **6 Claims**



1. Device for replacing in a controlled amount a first, used fluid lost by an hydraulic installation, by a second, new fluid, said device comprising

(a) a main receptacle having an overflow pipe passing through a wall of said main receptacle at a predetermined level and containing said second, new fluid;

(b) a secondary receptacle mounted on guiding means in said main receptacle so as to be freely movable in the vertical direction inside said main receptacle and to float in said second fluid contained in said main receptacle; and

(c) a drainage pipe fed with said first fluid lost by said hydraulic installation, and communicating with inner space of said secondary receptacle, so that said secondary receptacle is fed through said drainage pipe with said first fluid and has an increasing mass and thus is immersed in said second fluid to an increasing depth, as a function of the amount of said first fluid lost by said hydraulic installation;

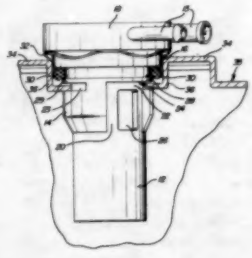
(d) said second fluid overflowing through said overflow pipe when said secondary receptacle is immersed to an increasing depth in said second fluid contained in said main receptacle, being used to replace said first fluid lost by said hydraulic installation.

4,960,153

FUEL TANK VAPOR VENT VALVE

Rudolph Bergsma, Ann Arbor, Mich., assignor to G. T. Products, Inc., Ann Arbor, Mich.

Filed Nov. 3, 1989, Ser. No. 431,624
Int. Cl.[5] F16K *51/00*
U.S. Cl. 137—587 **8 Claims**



1. A vapor vent valve assembly for removable locking insertion into a corresponding opening in the wall of a vehicle fuel tank, comprising:

a rigid valve body;

a locking means on said valve body engaging at least a portion of said opening when said valve body is inserted therein to provide both axial and rotary locking engagement between said valve body and said opening; and

O-ring seal means on said valve body providing a fluid-tight radial compression seal between said valve body and the tank wall adjacent said opening when said valve body is inserted into said opening; wherein,

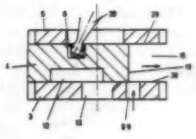
said locking means comprises an axially-acting spring mounted on said valve body, said axial spring engaging the outer surface of said fuel tank wall when said valve body is lockingly engaged with said opening.

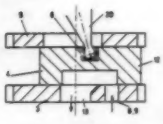
4,960,154

SANITARY WATER VALVE

Christos Dagiantis, Anthens, Greece, assignor to American Standard Inc., New York, N.Y.

Filed Sep. 19, 1988, Ser. No. 246,342
Claims priority, application Austria, Sep. 24, 1987, 2428/87
Int. Cl.[5] F16K *11/078*
U.S. Cl. 137—625.17 **12 Claims**





1. A sanitary water valve for diverting the flow of water to tap stations, said sanitary water valve comprising:

a housing having water tap stations;

first, second and third valve disks lying parallel to each other in said housing,

said first valve disk having a top surface and being fixed against rotation with water inlets and at least one water outlet, said second valve disk being movable relative to said first valve disk and having a lateral surface channel for water diversion purposes and a sealing surface for closing off said water inlets,

said lateral surface channel of the second valve disk and said top surface of the first valve disk forming the boundaries of a mixing chamber for one of said tap stations,

an actuating lever for moving said second valve disk with respect to said first valve disk so as to selectively connect said water inlets to said water tap stations by way of said surface channel,

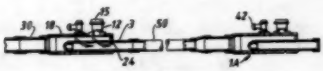
said third valve disk is fixed with respect to said first valve disk and has a bottom surface and an opening through which passes said actuating lever, a top surface of said second valve disk being displaceably in contact with said bottom surface of said third disk and being displaceable with respect to said third disk in response to movement of said actuating lever.

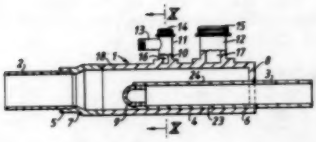
4,960,155

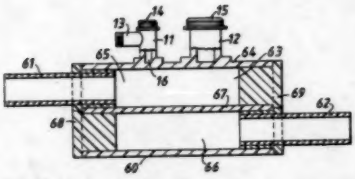
DEVICE FOR PERMITTING A FIRST LENGTH OF PREVIOUSLY COMMISSIONED MAIN TO BE EXTENDED BY CONNECTING A SECOND LENGTH OF MAIN THERETO

Russell J. Monrose, Brentwood, England, assignor to British Gas plc, England

Filed Aug. 5, 1988, Ser. No. 228,674
Claims priority, application United Kingdom, Aug. 5, 1987, 8718561; Aug. 27, 1987, 8720187
Int. Cl.[5] F16L *9/00*; F16K *11/07*
U.S. Cl. 138—178 5 Claims







1. A device by which a second length of main can be connected to a first length of previously commissioned main to extend the main, said device comprising:

a duct having a solid outer wall, an inlet for connection to the first length of main, and an outlet for connection to the second length of main;

a solid barrier wall which is fixedly located with respect to the outer wall and which extends across the interior of the duct so as to block off communication between the inlet and the outlet; and

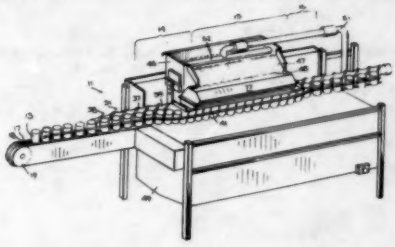
two ports on the exterior of the outer wall of the duct, each port being closed by portions of the outer walls, said portions defining respective penetrable regions on the outer wall through which tools can penetrate to the interior of the duct, one of the regions having a relatively small penetrable area and the other region having a relatively large penetrable area, the solid barrier wall having two areas from which respective wall portions are removable by the tools to leave, on retraction of the tools, one of the two barrier wall areas defining a relatively small sized open hole and the other of the two barrier wall areas defining a relatively large sized open hole, thereby to effect two routes of communication between the inlet and the outlet.

4,960,156

METHOD AND APPARATUS FOR TOPPING OFF CONTAINERS WITH LIQUID TO PREDETERMINED HEADSPACE LEVEL

Claude Tribert, Bedminster, N.J., assignor to Howden Food Equipment, Inc., Boston, Mass.

Filed Jan. 13, 1989, Ser. No. 297,139
Int. Cl.[5] B65B *3/08*
U.S. Cl. 141—1 12 Claims



1. A method for topping up a line of rapidly moving open top containers with liquid to an accurately reproducible headspace level in each container, the method including advancing a line of open top containers along a predetermined substantially straight path through an elongated filling region, tilting the containers to a predetermined angle during their passage through at least a final portion of the filling region, and discharging liquid in a stream extending longitudinally through the filling region in the direction of said predetermined path above the open tops of the containers, and returning the containers to an upright condition after they leave the filling region, wherein the improvement comprises

the step of advancing the line of containers comprises

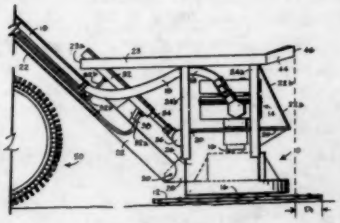
engaging successive containers in the line with successive turns of a feeder screw extending parallel to the predetermined path through at least said final portion of the filling region, and continuing said engagement at least until the containers have returned to the upright condition.

4,960,157

BUSH AND TREE CUTTER

Kerney T. Sheets, P.O. Box 771, Duplessis, La. 70728

Filed Nov. 1, 1988, Ser. No. 265,720
Int. Cl.[5] A01G *23/02*
U.S. Cl. 144—34 R 24 Claims



1. An apparatus for cutting trees and bushes comprising:

a. a circular steel cutting disk having a smooth top side and a smooth bottom side, said disk having cutting teeth connected to the periphery thereof, said disk having a thickness of at least 5/16 inches,

b. motor means connected to the top of said disk for rotating said disk about an axis at the center of said disk perpendicular to the side of said disk, and

c. moveable arm means connected to said motor means for moving said disk into contact with said trees and bushes.

4,960,158

PROCESS FOR PRODUCING A ZINC-PLATED STEEL SHEET WITH AN AGEING RESISTANCE BY HOT DIP-TYPE, CONTINUOUS ZINC PLATING

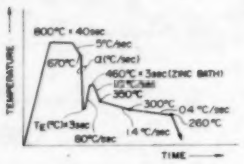
Teruaki Yamada, Hyogo; Osamu Akisue, Kanagawa; Toshiyasu Ukena, Hyogo; Masahiko Oda, Hyogo, and Teruki Hayashida, Hyogo, all of Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Mar. 7, 1989, Ser. No. 319,946

Claims priority, application Japan, Sep. 28, 1988, 63-243471

Int. Cl.[5] C21D *9/52*

U.S. Cl. 148—156 **9 Claims**



1. A process for producing a zinc-plated steel sheet with an ageing resistance from a cold rolled steel sheet by hot dip type, continuous zinc plating including steps of recrystallization and annealing, which comprises

subjecting a cold rolled steel sheet essentially consisting of 0.010 to 0.10% by weight of C, 0.05 to 0.7% by weight of Mn, 0.002 to 0.035% by weight of S, less than 0.15% by weight of P, 0.01 to 0.10% by weight of soluble Al, 0.0010 to 0.0070% by weight of N, and the balance being iron and inevitable impurities to recrystallization and grain growth,

quenching the steel sheet from 720°~600° C. to a quenching end temperature (T_E) of 310°~200° C. at a cooling rate (α) of 30°~250° C./sec,

keeping the steel constant at that temperature for 0~15 seconds, then

reheating the steel sheet to a molten zinc bath temperature,

dipping the steel sheet into the molten zinc bath, thereby zinc-plating the steel sheet,

cooling the steel sheet from that temperature to 350° C. at a cooling rate of 250°~5° C./sec,

cooling the steel sheet at an average cooling rate, $C.R_2$, defined by the following formula (1) in a temperature region of from below 350° C. to 300° C. and then

cooling the steel sheet at an average cooling rate, $C.R_3$, defined by the following formula (2) in a temperature region of from below 300° C. to 285°~220° C.:

$$C.R_{2S} \leqq C.R_2 \leqq C.R_{2A} \quad \text{(1)}$$

$$C.R_{3S} \leqq C.R_3 \leqq C.R_{3A} \quad \text{(2)}$$

where

$$C.R_{2S}=(-2.983\times(1/\alpha)+0.168)\times \exp(-0.0130\times T_E+5.18)$$

$$C.R_{2A}=(-4.185\times(1/\alpha)+0.263)\times \exp(-0.0130\times T_E+6.06)$$

$$C.R_{3S}=(-0.695\times(1/\alpha)+0.0392)\times \exp(-0.0130\times T_E+5.18)$$

$$C.R_{3A}=(-1.313\times(1/\alpha)+0.0741)\times \exp(-0.0130\times T_E+6.06)$$

α: cooling rate of quenching before supercooling (° C./sec)

T_E: quenching end temperature (° C.), where 220° C. is made to be the lowest temperature even if it is lower than 220° C.

$C.R_{2S}$: minimum average cooling rate in a temperature region of from below 350° C. to 300° C. (° C./sec)

$C.R_{2A}$: maximum average cooling rate in a temperature region of from below 350° C. to 300° C. (°C./sec)

$C.R_{3S}$: minimum average cooling rate in a temperature region of from below 300° C. to 285°~220° C. (°C./sec)

$C.R_{3A}$: maximum average cooling rate in a temperature region of from below 300° C. to 285°~220° C. (°C./sec).

4,960,159

ANTI-SKID DEVICE FOR TIRED VEHICLE WHEELS

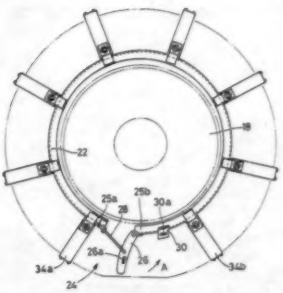
Yutaka Oda, 8-17, Mihonosato, Takasago-shi, Hyogo-ken, Japan

Filed Mar. 21, 1989, Ser. No. 326,673

Claims priority, application Japan, May 28, 1988, 63-130727; Sep. 5, 1988, 63-116498

Int. Cl.[5] B60C *27/20, 27/02*

U.S. Cl. 152—216 **16 Claims**



1. An anti-skid device for mounting on a vehicle wheel with a tire, the anti-skid device comprising:

a setting member, said setting member being securable to said vehicle wheel, said setting member including a peripheral annular setting portion which is concentric with said vehicle wheel after securement thereto;

a deformable supporting member removably mountable around said peripheral annular setting portion of said setting member;

fastening means for tightly securing said deformable supporting member around said peripheral annular setting portion of said setting member by fastening a pair of free ends of said supporting member to each other, said supporting member deforming and assuming a generally annular configuration around said peripheral annular setting portion when fastened thereto, said supporting member fitting loosely around said peripheral annular setting portion unless said free ends of said supporting member are fastened to each other by said fastening means; and

a plurality of elastically deformable anti-skid arms fixed to said deformable supporting member, said anti-skid arms extending radially outwardly over a side wall of said tire and being angularly spaced apart from each other in a circumferential direction of said tire when mounted thereon, each of said anti-skid arms including a bent portion which is elastically deformed and forcedly engaged with a tread surface of said tire when said supporting member is tightly secured around said peripheral annular

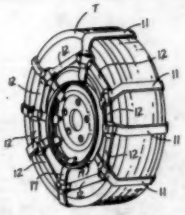
setting portion by fastening said free ends of said supporting member to each other with said fastening means.

4,960,160

VEHICULAR TRACTION STRAP ARRANGEMENT

Michael J. Stacy, P.O. Box 424, Norfolk, N.Y. 13667

Filed Apr. 17, 1989, Ser. No. 339,300
Int. Cl.[5] B60C *27/02*
U.S. Cl. 152—216 **2 Claims**



1. A vehicular traction apparatus in combination with a vehicular tire including a central wheel opening defined by a predetermined diameter, wherein said vehicular tire includes a forward side wall and a rear side wall, and said apparatus comprises,

a first series of individual traction bands extending orthogonally across the road contacting surface of the tire, each traction band including a forward terminal end extending to the forward side wall and a rear terminal end extending to the rear side wall, and

a second series of individual forward side wall bands arranged annularly about the forward side wall of the tire, and

a third series of individual rear side wall bands arranged annularly about the rear side wall of the tire, and

a fourth series of rear anchor bands coextensively aligned with a rear terminal end of each traction band, each rear anchor band including a rear anchor band forward end and a rear anchor band rear end, and

a fifth series of forward anchor bands coextensively aligned with the forward terminal ends of each traction band, each forward anchor band including a forward anchor band and a forward anchor band rear end, and

each end of each forward side wall band joined to a forward terminal end of each traction band, each end of each rear side wall band joined to a rear terminal end of each traction band, and

each rear anchor band forward end integrally secured to a rear anchor ring, and

each forward anchor band forward end adjustably arranged through a forward anchor ring, and

wherein the rear anchor ring comprises a rigid annular ring of a fixed diameter less than the predetermined diameter of the wheel opening of each tire, and the forward anchor ring comprising a rigid annular ring of a diameter less than the wheel diameter of the tire, and

wherein each end of each forward side wall band and each end of each rear side wall band is secured to each end of the respective traction band with a rectangular securement ring, and

wherein the forward anchor ring includes an annular slot receiving each forward anchor band forward end of each forward anchor band therethrough, and

wherein the forward anchor ring comprises an arcuate interior face to engage a lock member removably arranged through each forward anchor band forward end, and

wherein each forward anchor band forward end includes a series of cylindrical sleeves orthogonally arranged through each forward terminal end of each forward anchor band, and

wherein each forward anchor band forward end includes a rigid adjustment loop extending coextensively outwardly of each forward terminal end of each forward anchor band wherein each adjustment loop selectively receives a lever tool to extend the forward terminal of each forward anchor band through the associated slot, and

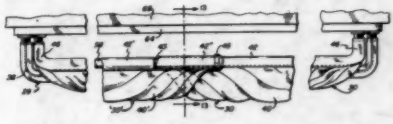
wherein the lock member comprises a cylindrical lock pin, and the cylindrical lock pin is formed with an enlarged arcuate head of a predetermined configuration receivable within, and complementary to, an arcuate interior face of the forward anchor ring.

4,960,161

READY-MADE CURTAIN SYSTEM INCLUDING SWAGS AND JABOTS

Madlyn Easley, 75 Brightwood La., West Hartford, Conn. 06110

Continuation-in-part of Ser. No. 3,547, Jan. 15, 1987. This application Dec. 26, 1989, Ser. No. 457,179
Int. Cl.[5] A47H *1/00*
U.S. Cl. 160—126 **18 Claims**



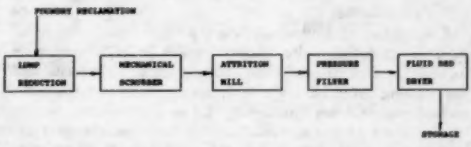
1. A curtain system comprising: a pair of parallel curtain rods, one mounted behind the other and in substantially the same horizontal plane; a pair of jabots mounted on the forward rod, each including a panel that is folded upon itself and secured in that condition to provide a multiplicity of permanent folds extending lengthwise thereof, and each having a laterally extending pocket along the top edge of said panel through which said forward rod is received; at least two swags mounted on the rearward rod, each including a panel that is draped over said forward rod, and a sleeve piece on said panel providing a laterally extending pocket through at least a portion of which said rearward rod is received, said sleeve piece of at least one of said swags having at least one opening at a location along the expanse of said panel thereof adapted to permit passage of said rearward rod therethrough out of said pocket thereof, and defining a free portion of said swag to one side of said opening, said swags being disposed side-by-side on said rearward rod with said free portion of said one swag overlapping an adjacent portion of the other of said swags, said panels of said swags overlapping one another and hanging in front of upper portions of said jabots; and securing means for fastening said free portion of said one swag, superimposed over said adjacent portion of said other swag, to said rearward rod.

4,960,162

METHOD OF RECLAIMING FOUNDRY SAND

Richard J. Millager, Beaverton, Oreg., assignor to Esco Corporation, Portland, Oreg.

Filed Feb. 17, 1989, Ser. No. 312,630
Int. Cl.[5] B02C *19/12, 23/20*
U.S. Cl. 164—5 **5 Claims**



1. A method of reclaiming binder-containing foundry sand containing a water soluble binder comprising:

reducing lumps of used sand resulting from a foundry casting process to grain size,

mechanically cleaning said grain-sized sand to remove wash-inhibiting impurities and a portion of said binder,

waterwashing said mechanically-cleaned sand to remove substantially all the remaining binder and to provide said sand in water slurry form, pressing said sand slurry with an air-loaded piaten to reduce the moisture content to about 5%, and

drying said pressed sand to reduce the moisture content to less than about 1/2%.

4,960,163

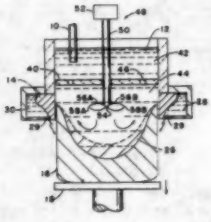
FINE GRAIN CASTING BY MECHANICAL STIRRING

Que-Tsang Fang, Murrysville, and Michael J. Kinosz, Apollo, both of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Nov. 21, 1988, Ser. No. 274,309

Int. Cl.[5] B22D *11/00*

U.S. Cl. 164—459 **53 Claims**



1. An apparatus for casting a melt into an ingot possessing a fine grain structure, said apparatus comprising:

a mold, said mold holding a reservoir of melt;

a partition means located in and extending across said melt to divide said melt into a melt supply reservoir located on a first side of said partition means and a solidification reservoir on a second side of said partition means, said partition means having at least one opening for permitting melt to flow from said melt supply reservoir to said solidification reservoir and an additional opening for a mixing means, said partition means preventing turbulence from said solidification reservoir transferring to the gas-exposed surface of said melt; and

mixing means for mixing the portion of said melt located in said solidification reservoir, said means for mixing providing nuclei for grain refinement of said ingot.

4,960,164

METHOD OF CONTINUOUSLY CASTING A THIN STRIP

Hermann Rametsteiner, Dornach; Karl Schwaha, Linz; Franz Hirschmanner, Linz, and Heinz Bramerdorfer, Linz, all of Austria, assignors to Voest-Alpine Industrieanlagenbau Gesellschaft m.b.h., Austria

Filed Jan. 12, 1989, Ser. No. 296,553

Claims priority, application Fed. Rep. of Germany, Jan. 26, 1988, 3802202

Int. Cl.[5] B22D *11/06*

U.S. Cl. 164—480 **8 Claims**

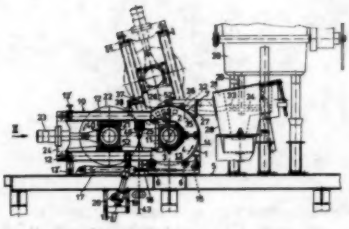
1. A method of continuously casting a thin continuous, metal member of substantially uniform width in an arrangement including a first casting drum rotating about a first axis, said first casting drum having a first casting drum surface, and a second casting drum rotating about a second axis, said second casting drum having a second casting drum surface, said second casting drum surface spaced apart from said first casting drum surface by substantially a uniform thickness of said metal member, comprising the steps of:

(a) casting metal melt onto said first casting drum surface at a cast-on site,

(b) forming a casting gap between said first casting drum surface and said second casting drum surface,

(c) forming a sump between said first casting drum and said second casting drum at an adjustable distance from the cast-on site of said metal melt, said distance being adjustable by pivoting said second casting drum about said first axis,

(d) allowing a first strand shell to form on said first casting drum surface between said sump and said cast-on site and



a second strand shell to form on said second casting drum surface, upon contact with said sump, and

(e) adjusting the position of said casting gap to a position on the circumference of said first casting drum such that the maximum thickness of said first and second strand shells, in total, corresponds to at least the thickness of said cast member,

wherein said first and second strand shells formed on said first and second casting drum surfaces are conveyed to said casting gap by the rotation of said first and second casting drums.

4,960,165

METHOD AND APPARATUS FOR ADJUSTING A MOLD DURING CASTING IN A CONTINUOUS METAL CASTING PROCESS

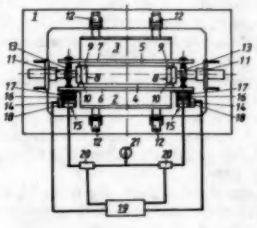
Helmut Eidinger, Schoenering, and Werner Scheurecker, Linz, both of Austria, assignors to Voest-Alpine Industrieanlagenbau Gesellschaft mbH, Linz, Austria

Filed Nov. 8, 1989, Ser. No. 433,312

Claims priority, application Fed. Rep. of Germany, Nov. 9, 1988, 3838010

Int. Cl.[5] B22D *11/04*

U.S. Cl. 164—491 **6 Claims**



1. A method for adjusting a mold during a continuous metal casting process, the mold having first and second, relatively smaller end walls clamped between first and second, relatively larger side walls by biasing the side walls with a predetermined clamping force against the end walls, the mold being adjusted by moving the end walls to a desired casting width, the method comprising the steps of

measuring the thermal expansion of the end walls during at least the start-up period of the continuous casting process,

storing a measured expansion value,

releasing the clamping force,

thereafter moving the large side walls away from each other to form a gap of predetermined width between the thermally expanded end walls and the side walls,

thereafter moving the end walls to the desired casting width, and

thereafter re-applying the predetermined clamping force to the larger side walls.

4. An apparatus for adjusting the casting width of a continuous metal casting mold comprising,

a rectangular mold having first and second, relatively smaller end walls disposed between first and second relatively larger side walls,

means for moving the end walls to adjust the casting width,

clamping means for releasably applying a predetermined clamping force to the side walls and clamping the smaller end walls therebetween,

displacement means for moving the larger side walls away from the smaller end walls when the clamping force has been released,

sensor means for continuously detecting.. changes in the spacing between the larger side walls,

calculating means connected to the sensor means for calculating the instantaneous spacing between the larger side walls and for calculating a release position of the larger side walls by adding a predetermined gap width to the instantaneous spacing, and

control means connected to the calculating means for activating and controlling the displacement means to move the larger side walls into the release position.

4,960,166

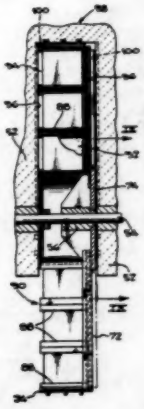
ROTARY HEAT WHEEL STRUCTURE AND METHOD

John H. Hirt, Fullerton, Calif., assignor to Hirt Combustion Engineers, Montebello, Calif.

Filed Jul. 31, 1989, Ser. No. 387,539

Int. Cl.[5] **F28D** *19/04*

U.S. Cl. 165—9 **2 Claims**



2. In a rotary wheel heat exchange apparatus including a wheel housing having a pair of diametrical housing pillars defining generally semi-circular openings in the wheel housing, one opening being for passage of hot gasses discharged under pressure from a burner means, and the other opening for passage of ambient or cool gasses under less pressure to be burned, said pillars including spaced opposed interior surfaces, a rotary heat exchange wheel including a hub means for receiving a drive shaft mounted in said housing pillars; the improvement comprising in combination:

a plurality of radial grooves in said pillar surfaces extending from said hub means toward said cylindrical wall, said grooves having widths much greater than the depths of said grooves to cause turbulence of gasses between said wheel surfaces and said pillars to reduce leakage between said semi-circular openings of hot gasses and cool gasses while said rotary wheel is being rotated.

4,960,167

HEAT EXCHANGER

Stig Stenlund, Saltsjöbaden, Sweden, assignor to Hypeco AB, Malmo, Sweden

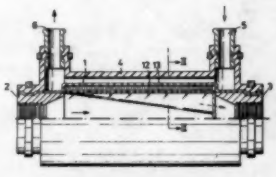
PCT No. PCT/SE88/00069, § 371 Date Jul. 28, 1988, § 102(e) Date Jul. 28, 1988, PCT Pub. No. WO88/06706, PCT Pub. Date Sep. 7, 1988

PCT Filed Feb. 18, 1988, Ser. No. 224,947

Claims priority, application Sweden, Feb. 24, 1987, 8700772

Int. Cl.[5] **F28D** *7/10*; **F28F** *1/42, 21/06*

U.S. Cl. 165—40 **7 Claims**



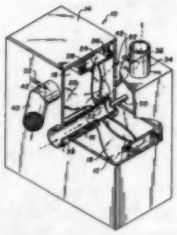
1. A heat exchanger for effecting an exchange of heat between two liquid media, comprising means for forming two flow chambers which are mutually separated in a liquid-tight manner by means of a common liquid-impervious partition wall and each of which is intended to conduct one of said media therethrough, characterized in that the partition wall is substantially tubular with a generally circular cross-section having on its inner surface a plurality of peripherally inwardly extending fins which define therebetween peripherally extending slot-like flow channels for said one medium said partition wall having open axial ends which form an inlet and an outlet respectively for said one medium; in that the partition wall is encircled by a substantially cylindrical sleeve-like outer wall which extends coaxially with the partition wall in spaced relationship therewith, the axial ends of said cylindrical outer wall being sealingly connected to the outer surface of the partition wall; in that said outer wall is provided with an inlet and an outlet for the other of said media; in that the cylindrical outer wall defines with the partition wall a flow chamber for said other medium; in that at least the major part of the cylindrical outer wall is formed of an elastically flexible polymeric material, such as to enable said outer wall to move relative to the partition wall and such that the radial distance between the outer wall and the partition wall can vary locally; and in that the outer surface of the partition wall has provided thereon axially extending, radially projecting fins and the elastically flexible outer wall is provided with axially extending, radially inwardly directed fins located between said fins on the outer surface of the partition wall; said inlet and said outlet for said other medium being located in the vicinity of a respective axial end of the flexible outer wall.

4,960,168

HEAT EXCHANGER

Raymond L. Anderson, Box 3031, Langley, British Columbia, Canada (V3A 4R3)

Filed Apr. 28, 1989, Ser. No. 345,118
Int. Cl.[5] F28F 5/04
U.S. Cl. 165—92 14 Claims



1. A heat exchanger fan comprising:
a hollow central shaft;
a plurality of hollow blades formed on the central shaft;
a peripheral flange attached to the distal ends of the hollow blades;
means communicating the interior of the shaft with the interior of the blades;
opening at the distal ends of the blades extending through the peripheral flange; and
at least one ancillary fan on the hollow central shaft, able to move from a first position, where it is locked on the shaft to be driven with the shaft, to a second position where it is not driven by the shaft.

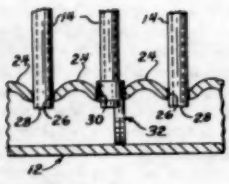
14. A heat exchanger fan comprising:
a hollow central shaft;
a plurality of hollow blades formed on the central shaft;
baffles within the hollow blades to direct air flow;
a peripheral flange attached to the distal ends of the hollow blades;
means communicating the interior of the shaft with the interior of the blades; and
openings at the distal ends of the blades extending through the peripheral flange.

4,960,169

BAFFLE FOR TUBULAR HEAT EXCHANGER HEADER

Dennis Granetzke, Racine, Wis., assignor to Modien Manufacturing Co., Racine, Wis.

Filed Jun. 20, 1989, Ser. No. 369,626
Int. Cl.[5] F28F 9/02
U.S. Cl. 165—173 4 Claims



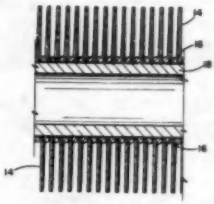
1. A heat exchanger including:
opposed headers, at least one of which is a header tube having a plurality of slots in a side thereof;
a plurality of generally parallel tubes extending slots; and
a baffle in said header tube dividing the same into discrete sections and having a collar disposed about an end of one of said parallel tubes.

4,960,170

FINNED TUBE AND METHOD OF MAKING THE SAME

James I. Carter, P.O. Box 470523, Tulsa, Okla. 74147

Filed Jan. 26, 1989, Ser. No. 301,967
Int. Cl.[5] F28F 1/36
U.S. Cl. 165—184 8 Claims



1. A method of making a finned tube from a fin having a relatively higher coefficient of expansion than that of the tube upon which the fin is wound which comprises winding the fin helically on the tube while simultaneously winding a wire in side by side relation with the fin on the surface of the tube such that each winding of wire is snuggly received between adjacent windings of fin, the wire being made of a material having the same or similar coefficient of expansion as compared to the material of the tube.

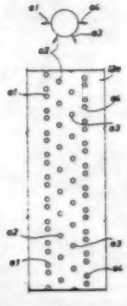
5. A finned tube for a heat exchanger comprising a hollow metallic tube having a given coefficient of theremal expansion, a fin helically wound on the tube and having a higher coefficient of thermal expansion as compared to that of the tube, and a wire helically wound on the tube between adjacent windings of fin and in abutting relationship with adjacent windings of fin, the wire havine a coeficient of thermal expansion equal to or less than the given coefficient of expansion of the tube.

4,960,171

CHARGE PHASING ARRANGEMENTS IN A PERFORATING GUN

Robert A. Parrott, Houston, and Gary M. Lendermon, Missouri City, both of Tex., assignors to Schlumberger Technology Corporation, Houston, Tex.

Filed Aug. 9, 1989, Ser. No. 391,807
Int. Cl.[5] E21B 43/116
U.S. Cl. 166—55 17 Claims



1. A perforating gun adapted for use in a borehole, comprising:
a plurality of charges aligned in a plurality of rows located on a surface parallel to the longitudinal axis of said gun,

each of said charges being constrained to point in a direction which lies within a partial circumference of said gun, the partial circumference being less than 360 degrees; and

a carrier enclosing said charges, said carrier including a plurality of recesses corresponding, respectively, to said plurality of charges,

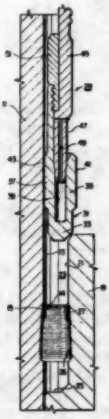
said plurality of recesses including a first row of recesses having a first number of recesses per unit length, a second row of recesses having a second number of recesses per unit length, and at least one third row of recesses having a third number of recesses per unit length, said third row being interposed between said first and second rows of recesses, said first number of recesses per unit length being greater than said third number of recesses per unit length.

4,960,172

CASING HANGER SEAL ASSEMBLY WITH DIVERGING TAPER

John E. Nelson, Houston, Tex., assignor to Vetco Gray Inc., Houston, Tex.

Filed Aug. 18, 1989, Ser. No. 395,809
Int. Cl.[5] E21B *33/04*
U.S. Cl. 166—208 **5 Claims**



1. In a well having a wellhead housing with a bore defining an inner wall, a casing hanger located in the bore and having an outer wall radially spaced from the inner wall of the wellhead housing, defining an annular clearance, an improved means for sealing the annular clearance, comprising in combination:

a downward inclined tapered section on at least one of the walls in the annular clearance, defining a width of the annular clearance in the tapered section which increases in a downward direction;

a metal seal member for sealing in the annular clearance, having annular inner and outer legs radially spaced apart from each other to define an annular slot, the outer leg having an outer sealing surface, the inner leg having an inner sealing surface, the inner and outer sealing surfaces being of substantially the same length;

the tapered section having an axial length that is substantially the same axial length as the inner and outer sealing surfaces;

the seal member being movable downward from an initial position located above the tapered section during cementing to a setting position with its outer sealing surface facing the inner wall of the wellhead and its inner sealing surface facing the outer wall of the casing hanger, and with one of the sealing surfaces located adjacent the tapered section; and

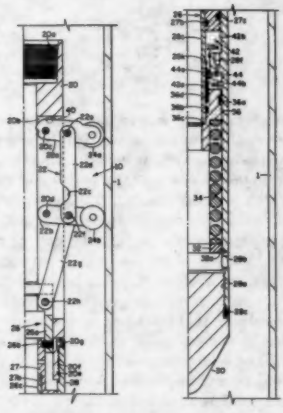
an energizing member carried with the seal member for movement from an upper position to a lower position within the slot after the seal member is in the setting position for wedging the legs of the seal member radially apart, and for forcing one of the sealing surfaces into sealing engagement with the tapered section.

4,960,173

RELEASABLE WELL TOOL STABILIZER

Michael L. Cognevich, Tulsa, and Steven H. Shirk, Broken Arrow, both of Okla., assignors to Baker Hughes Incorporated, Houston, Tex.

Filed Oct. 26, 1989, Ser. No. 426,769
Int. Cl.[5] E21B *17/10*
U.S. Cl. 166—241 **3 Claims**



1. A stabilizer housing for a well tool mounted in a cased subterranean well comprising, in combination:

a tubular body connectable in co-axially aligned series relationship to the well tool;

spaced, longitudinal slots extending through the wall of said tubular body, with an upper and a lower end;

a radially expandable linkage disposed in each said longitudinal slot;

means for pivotally securing one end of each said linkage in one end of the respective longitudinal slot, whereby axial movement of the other end of each said linkage relative to said tubular body shifts said linkage from a radially contracted run-in position to a radially expanded position;

anti-friction means carried by each said linkage engagable with the well casing in said radially expanded position;

a compressed spring mounted in the other end of said tubular body;

a force transmitting assemblage interconnecting said spring and said lower ends of said linkages, thereby urging said linkages to said radially expanded positions;

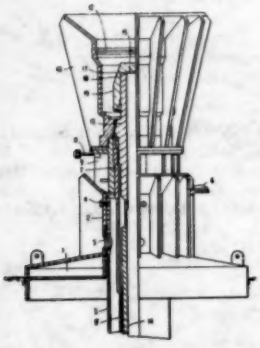
said force transmitting assemblage comprising two releasably connected members separable in response to a predetermined upward force applied to said tubular body when said expanded linkages become stuck in the well.

4,960,174

EQUIPMENT FOR OIL WELL DRILLING AND COMPLETING OPERATIONS IN DEEP WATER

Renato S. Rodrigues, Niterói, and Jayme H. Ogura, Macaé, both of Brazil, assignors to Petroleo Brasileiro S.A. - PETROBRAS, Rio de Janeiro, Brazil

Division of Ser. No. 143,535, Jan. 13, 1988, Pat. No. 4,877,088.
This application Aug. 3, 1989, Ser. No. 389,148
Claims priority, application Brazil, Jan. 13, 1987, 8700104
Int. Cl.[5] E21B *33/038*
U.S. Cl. 166—342 1 Claim



1. Apparatus for oil well drilling and completing operations in deep water which allows an oil well drilled in deep water to start producing, said operations being conducted from a dynamically placed vessel, comprising a permanent guide base (9) containing a high pressure housing (13) having an upper free end (15) adapted to receive safety, drilling and production (completion) equipment, the upper free end of the housing being covered by a protective cover (17) having an external conical part (18), and a releasable guide-funnel (10) attached to said base by means of a releasing device activatable by a remote control vehicle, said releasing device holding a bottom cylindrical part of said releasable guide-funnel in contact with a top plate (25) of said permanent guide base during drilling and completing operations, said protective cover capable of performing the guiding function of the guide-funnel after removal of the guide-funnel when a production (completion) base (20) is lowered onto the permanent guide base, wherein said releasing device comprises a pin kept expanded by a spring housed in a hole in the bottom cylindrical part of the guide-funnel; which locks said bottom part against said top plate of the permanent guide base, said pin being forced into the hole and releasing said guide-funnel when a cotter-pin system has been actuated by a remote control vehicle which twists a grip connected to said cotter-pin system.

4,960,175

EQUIPMENT FOR RAISE MINING

Roland Granskog, Skelleftea, Sweden, assignor to Alimak AB, Skelleftea, Sweden

PCT No. PCT/SE88/00074, § 371 Date Sep. 12, 1989, § 102(e) Date Sep. 12, 1989, PCT Pub. No. WO88/07123, PCT Pub. Date Sep. 22, 1988
PCT Filed Feb. 19, 1988, Ser. No. 401,441
Claims priority, application Sweden, Mar. 20, 1987, 8701161; Dec. 9, 1987, 8704911
Int. Cl.[5] E21B *41/00*
U.S. Cl. 175—86 15 Claims

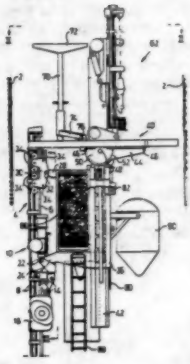
1. An arrangement in an assembly for raise driving, said assembly including:

a drive support for carrying at least one drill boom rig intended for mechanized drilling and movable to a collapsed disabled position;

a guide attached to a drift wall and being successively lengthened as drift driving proceeds;

a drive means carried by said drive support for driving said drive support along said guide;

an operator's and service platform having an opening; and



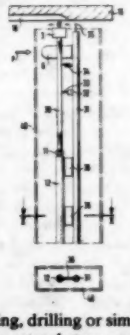
means for carrying said platform so as to be movable with respect to the drive support in the direction of the guide from a lower position with respect to the drive support in which the platform does not obstruct operating movements of the drill boom rig, to upper positions with respect to the drive support in which the drill boom rig assumes said collapsed disabled position and extends through said opening in said platform.

4,960,176

DEVICE FOR CUTTING, DRILLING OR SIMILAR WORKING OF ROCK, ORE, CONCRETE OR THE LIKE

Charles Loegel, Lichtenberg; Isabelle Durr; Sylvie Reichert, both of Ingwiller; Patrick Loegel, Lichtenberg, and Francine Schneider, Ingwiller, all of France, assignors to CIWJ Compagnie Internationale du Water Jet, France

PCT No. PCT/EP88/00593, § 371 Date Sep. 29, 1989, § 102(e) Date Sep. 29, 1989, PCT Pub. No. WO89/01396, PCT Pub. Date Feb. 23, 1989
PCT Filed Jul. 5, 1988, Ser. No. 411,531
Claims priority, application Fed. Rep. of Germany, Aug. 11, 1987, 3726733; Nov. 24, 1987, 3739825
Int. Cl.[5] E21B *7/18;* E21C *25/60*
U.S. Cl. 175—424 24 Claims



1. A device for cutting, drilling or similar working of materials, such as rock, ores, natural stone, or concrete by means of a pressure medium, in which said pressure medium is supplied via a supply pipe to a nozzle head and is directed through at

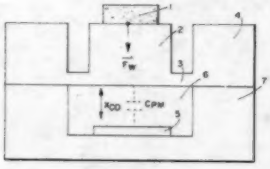
least one nozzle thereof in the form of a jet at a traversing angle onto said material, and in which a drive mechanism drives the nozzle head to produce an oscillatory motion substantially transversely to the direction of the jet, characterized in that the supply pipe comprises a rocking pipe (30) which causes the oscillatory motion of the nozzle head (3) and which is engaged by said drive mechanism (32, 33) which is supported by a control pipe (31) extending substantially parallel to said rocking pipe (30), said control pipe conducting the energy carrier to the drive mechanism (32) for actuating the same and including guide means (6) for the rocking pipe (30).

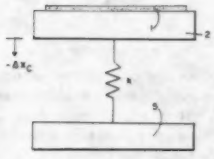
4,960,177

SILICON MEMBRANE MICRO-SCALE

James W. Holm-Kennedy, and Donald K. Umemoto, both of Honolulu, Hi., assignors to University of Hawaii, Honolulu, Hi.

Filed Jun. 3, 1988, Ser. No. 201,881
Int. Cl.[5] G01G *3/14*; G01L *9/12*
U.S. Cl. 177—210 C **24 Claims**





1. The method of measurement of weight comprising displacing a capacitive plate by a gravitational force vector and electrically sensing capacitive change and determining weight as a function of capacitive change, further comprising supporting the capacitive plate on a silicon membrane and determining the spring constant of the silicon membrane.

4,960,178

MOTOR-DRIVEN POWER STEERING APPARATUS

Toshimi Abukawa, Hitachioota; Toshiaki Okuyama, Naka; Kazuo Tahara, Hitachi; Katsuji Marumoto, Hitachi; Toshiyuki Koterazawa, Hitachi; Mitsuyuki Hombu, Katsuta; Tadashi Takahashi, Hitachi; Hisatugu Ishikura, Katsuta; Hirohisa Yamamura, Hitachioota; Toru Tatsuzaki, Hiratsuka; Tsutomu Omae, and Shuichi Takamatsu, both of Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo and Hitachi Automotive Engineering Co., Ltd., Ibaraki, both of, Japan

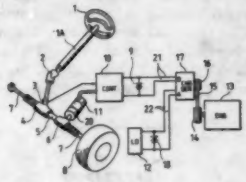
Filed Sep. 22, 1988, Ser. No. 247,509
Claims priority, application Japan, Sep. 30, 1987, 62-243800; Oct. 19, 1987, 62-261682
Int. Cl.[5] B62D *5/04*
U.S. Cl. 180—79.1 **4 Claims**

1. A motor driven power steering apparatus for a vehicle which depends on a DC power source as an energy source for electrical devices mounted on the vehicle having a steering shaft, comprising:

a generator driven by an engine of the vehicle, said generator having first winding means for generating a first DC voltage having a first voltage level and second winding means for generating a second DC voltage having a second voltage level which is higher than said first voltage level;

first and second voltage suppliers connected to said first and second winding means, respectively; and

actuator means for generating an auxiliary steering force for the vehicle, including a motor for providing an auxiliary



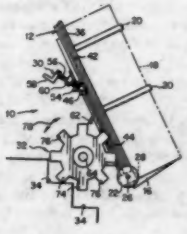
steering force, torque detector means for detecting a torque applied to the steering shaft of the vehicle and current control means connected between said second voltage supplier and said motor for controlling a current supplied to said motor to control said auxiliary steering force in response to said torque detector means, said first voltage supplier being connected to supply voltage to other electrical devices of the vehicle.

4,960,179

POWERED HEAVY-DUTY HAND TRUCK

Norman Leach, 2326 N. Eiffel Ct., Decatur, Ga. 30032

Filed May 19, 1989, Ser. No. 354,899
Int. Cl.[5] B62B *5/02*
U.S. Cl. 180—8.2 **5 Claims**



1. A powered heavy-duty hand truck for easily ascending and descending steps, comprising:

(a) a main frame with large diameter wheel means for the ascending and descending of said steps;

(b) mounting means for rotatively securing said large diameter wheel means;

(c) electric motor means for driving said large diameter wheel means;

(d) rechargeable battery pack means for powering said electric motor means;

(e) small diameter wheel means for said hand truck to traverse a relatively flat smooth surface, wherein said large diameter wheel means comprises a pair of wheels secured to a shaft of said electric motor means for driving said large diameter wheel means, and said shaft of said motor means is supported in said mounting means for securing said large diameter wheel means, and said mounting means comprises a pair of spaced apart plates fixedly secured to said main frame adjacent to said small diameter wheel means, wherein each large diameter wheel means that comprises said pair of wheels, is provided with a

plurality of equally and radially spaced apart lobes that project outward for engagement with said steps; and

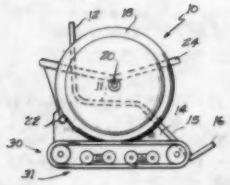
(f) crank mechanism means for elevating and lowering said small diameter wheel means, wherein said small diameter wheel means comprises a pair of small wheels secured to ends of an axle received in a pair of bearing boxes forming a part of said crank mechanism means for elevating and lowering said small diameter wheel means, and a T-shaped opening through each of said pair of bearing boxes freely and slideably receives a guide rail of a pair of guide rails that are fixedly secured to longitudinal sides of said main frame, and an elevating and lowering means for said pair of bearing boxes and said pair of small wheels comprise a pair of manually driven worm shafts, one of which has right handed threads and the other has left handed threads.

4,960,180

WHEELCHAIR

Troy W. Livingston, Northbrook, Ill., assignor to Livingston Products, Inc., Northbrook, Ill.

Filed May 13, 1988, Ser. No. 194,680
Int. Cl.[5] B62D *55.04*
U.S. Cl. 180—9.28 **7 Claims**



1. A wheelchair apparatus having a wheeled drive for travel over smooth hard surfaces and an endless track drive for travel over outdoor ground and rough terrain, said apparatus comprising:

a wheelchair having first and second wheels having lower peripheries for travel over smooth hard surfaces,

an attachment for connection to the wheelchair and having frame means for supporting the wheelchair for travel when using the endless tracked drive,

a chair in said wheelchair having the same fixed relationship with respect to the wheels and to the frame means when traveling over smooth hard surfaces or when travelling over rough terrain,

a pair of endless track means supported by said frame means each with an upper track run and a substantially lower horizontal track run to travel horizontally along the rough terrain,

means readily detachably mounting the frame means and the endless track means to the wheelchair for travel on the endless track means over rough terrain and for detachment therefrom to allow the wheels to travel on the ground when the frame means is detached from the wheelchair,

the lower periphery of each of the wheels being held by the frame means adjacent a lower run of the endless track means so that the occupant is not lifted so high as to experience a substantially different elevation when travelling on the endless track means as when travelling on said wheels,

suspension means on the frame means mounting each of the forward ends of each of the endless track means to lift over a projection therebeneath independently of the other forward and of the other endless track means to facilitate movement over a projection with reduced tilting of the chair and its occupant,

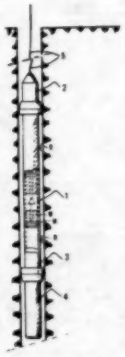
the pair of endless track means having a fixed relationship to the frame means and the chair to keep the upper and lower runs substantially horizontal when travelling over rough terrain.

4,960,181

METHOD AND DEVICE FOR IMPROVING THE COEFFICIENT OF TRANSMISSION TO GEOLOGICAL FORMATIONS OF ENERGY CREATED BY A WELL SEISMIC SOURCE

Eric Marin, Versailles, and Marcel Le Comte, Bezons, both of France, assignors to Institut Francais du Petrole, Rueil Malmaison, France

Continuation of Ser. No. 225,356, Jul. 28, 1988, abandoned. This application Oct. 12, 1989, Ser. No. 420,598
Claims priority, application France, Jul. 28, 1987, 87 10722
Int. Cl.[5] G01V *1/40*
U.S. Cl. 181—106 **12 Claims**



1. A method for making a substantial pinpoint emission of a pulsed seismic source, the method comprising the steps of lowering a pulsed seismic source inside one of a well or borehole, directly coupling the pulsed seismic source to walls of the well by retractable anchorage means for enabling an application of energy emitted by the pulsed seismic source directly to the walls, and confining a zone of the well containing the pulsed seismic source coupled with the wall by sealingly isolating the zone of the well cr ntaining the pulsed seismic source so as to prevent a propagation along the well, outside the confined zone, of a fraction of the energy generated by the pulsed seismic source when fired and not transmitted directly to the walls by direct coupling by the retractable anchorage means.

4,960,182

CONSTANT SPEED HOLDING APPARATUS

Munehiko Mimura; Takumi Tatumi; Yasuo Naito, and Kazuyori Katayama, all of Himeji, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 29, 1988, Ser. No. 213,054
Claims priority, application Japan, Jul. 2, 1987, 62-167177
Int. Cl.[5] B60K *31/04*
U.S. Cl. 180—179 **4 Claims**

1. A constant speed holding apparatus comprising:

a vehicle speed sensor which outputs a signal indicating an actual vehicle speed;

a cruise conditions setting means for setting cruise conditions including a target vehicle speed to be maintained;

a cancellation conditions detecting means for detecting conditions for cancellation of said cruise conditions;

a throttle actuator for controlling a throttle opening of an engine;

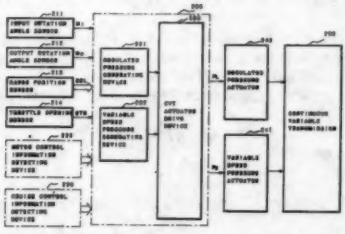
a constant speed cruise control means for driving said throttle actuator to perform constant speed cruise control in order to maintain said target vehicle speed on the basis of

the signal outputted from said vehicle speed sensor and indicating the actual vehicle speed and of the cruise conditions set by said cruise conditions setting means;

a condition set time detecting means for detecting a point of time at which the cruise conditions are set by said cruise conditions setting means or a specific period of time thereafter;

a continuous variable transmission disposed in a power train for power transmission from said engine;

a cruise information detecting means for detecting cruise information including said throttle opening; and



a continuous variable transmission controlling means performing variable speed ratio control of said continuous variable transmission to maintain said target cruise speed on the basis of said cruise information detected by said cruise information detecting means, said continuous variable transmission controlling means maintaining said variable speed ratio at a target variable speed ratio, and, upon detection of the time of said cruise conditions setting or the specified period of time after said setting, the variable speed, ratio immediately prior to the detected time being taken as said target variable speed ratio.

4,960,183

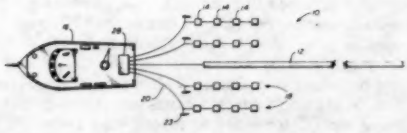
SEISMIC SOURCE FIRING CONTROL SYSTEM

Dewey R. Young, II, Houston, Tex., assignor to Exxon Production Research Company, Houston, Tex.

Filed Aug. 16, 1985, Ser. No. 766,230

Int. Cl.[5] H04R *1/02*

U.S. Cl. 181—107 **18 Claims**



1. A seismic survey system, comprising:

a plurality of seismic sources, each adapted to fire in response to receiving an electrical firing command signal;

a firing sensor positioned proximate each of said seismic sources, said firing sensor being adapted to generate an electrical firing detection signal in response to the corresponding seismic source being fired;

a firing circuit associated with and proximate to each of said seismic sources, each firing circuit being adapted to provide a firing command signal to the corresponding seismic source in response to receiving an electrical trigger signal;

a control unit adapted to receive said firing detection signals, to calculate an appropriate firing time for each of said seismic sources, and to apply an electrical trigger signal to each of said firing circuits to fire the corresponding seismic source at the appropriate instant, said control unit being positioned a spaced distance from said seismic sources; and,

an umbilical extending from said central seismic source control unit to said plurality of seismic sources and firing circuits, said umbilical being adapted to transmit trigger signals from said control unit to said firing circuits and to transmit firing detection signals from said firing sensors to said control unit.

4,960,184

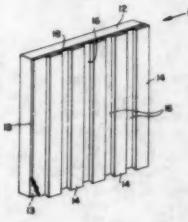
SOUND ABSORBING STRUCTURE

Bruce Woodward, 1408 Walnut La., Anchorage, Ky. 40223, and William Miller, RdR. 1, Box 248, Borden, Ind. 47106

Filed Nov. 9, 1989, Ser. No. 433,951

Int. Cl.[5] E04B *1/82, 1/343*

U.S. Cl. 181—287 **10 Claims**



1. An acoustical sound absorbing panel structure to be applied in overlaying relationship to a wall or ceiling surface comprising:

a panel of sound absorbing materials having a face and back surface; and,

a plurality of spaced apart, parallel strips of a non-sound absorbing material attached to said face surface of the sound absorbing panel, said face surface being exposed when the panel structure is applied to the wall or ceiling surface.

4,960,185

MOVABLE CRADLE

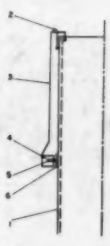
Gerhard Thiem, Haan, Fed. Rep. of Germany, assignor to GESTA Gesellschaft für Stahlrohrgerüste mbH, Berlin, Fed. Rep. of Germany

Filed Jun. 29, 1989, Ser. No. 373,866

Claims priority, application Fed. Rep. of Germany, Jun. 30, 1988, 3822424

Int. Cl.[5] E04G *3/10, 3/16*

U.S. Cl. 182—38 **6 Claims**



1. Movable cradle for the inside and outside walls of buildings made from reinforced concrete or steel wherein

a work platform is suspended by movable guide cables from an

upper carriage which can be moved along the top edge of the building, and

can be moved vertically along these cables by a motor drive unit characterized in that

a jib is attached to each side of the work platform and each jib is provided at its end with a magnetic plate which is fitted with ball rollers by means of which the work platform is moved over the surface of the building.

4,960,186

ELEVATOR HOIST APPARATUS WITH AN OUTER ROTOR MOTOR

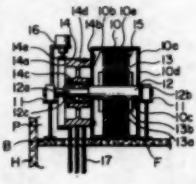
Takenobu Honda, Inazawa, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Jan. 19, 1989, Ser. No. 298,949

Claims priority, application Japan, Jan. 21, 1988, 63-11405

Int. Cl.[5] B66B *11/04*

U.S. Cl. 187—20 **3 Claims**



1. A gearless traction-type elevator hoist apparatus with an outer rotor motor comprising:

a support structure;

a sheave rotatably mounted on said support structure; and

an electric motor mounted on said support structure for driving said sheave, said motor comprising a stator fixedly mounted on said support structure, a motor housing including a cylindrical wall surrounding said stator and opposing sidewalls attached to said cylindrical wall, said sheave being mounted to one of said sidewalls for rotation with said housing, said housing comprising a rotor in an electromagnetically inductive relationship with said stator, said sheave providing the sole support for said motor housing.

4,960,187

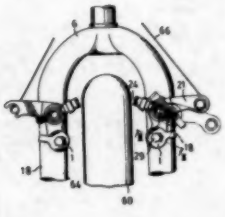
STOP WASHER FOR A BRAKE UNIT OF A BICYCLE

Yi-Chen Chi, No. 139-5, Anmei Rd., Hou Li Hsiang, Taichung Hsien, Taiwan

Filed Jun. 30, 1989, Ser. No. 373,827

Int. Cl.[5] F16D *65/06*

U.S. Cl. 188—24.12 **3 Claims**



1. A stop washer for a brake unit of a bicycle, said brake unit of said bicycle comprising a pair of brake devices being respectively pivoted to two frame bars of a frame fork of said bicycle, each brake device including a brake arm with a brake shoe fixed thereon, and said brake arms being actuated by a cable, said stop washer being generally a disc with a center hole formed thereon, a plurality of wedges being formed on said disc around said center hole, a stop being integrally provided on said disc extending in a plane substantially perpendicular to said disc, and said stop washer being disposed on a pivot axle of said brake device and arranged such that said stop extends across a rotational plane of said brake arm for limiting a rotational movement thereof.

4,960,188

SINGLE-TUBE VIBRATION DAMPER OF VARIABLE DAMPING FORCE

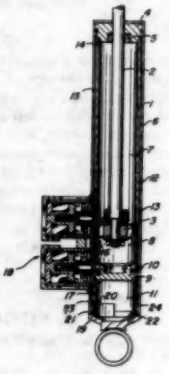
Felix Wössner, Schweinfurt, Fed. Rep. of Germany, assignor to Fichtel & Sachs AG, Schweinfurt, Fed. Rep. of Germany

Filed Sep. 11, 1989, Ser. No. 405,748

Claims priority, application Fed. Rep. of Germany, Sep. 17, 1988, 3831718

Int. Cl.[5] F16F *9/346*

U.S. Cl. 188—299 **5 Claims**



1. A single-tube vibration damper of variable damping force comprising:

a cylinder (1) containing damping fluid, and having a first end and a second end (23), the second end (23) forming an opening having the diameter of the cylinder (1),

a damping piston (3) slideably arranged in the cylinder (1) and separating the cylinder (1) into two working chambers (7, 8) each of which contains said damping fluid,

a piston rod (2) connected to the damping piston (3), the piston rod (2) exiting the cylinder (1) at the first end thereof,

means forming a gas chamber (11) which contains a gas filling under pressure,

a separator piston (9) slideably arranged in the cylinder (1), the separator piston (9) being sealed to the cylinder (1),and separating the gas chamber (11) from the working chambers (7, 8) containing said damping fluid,

a container (6) at least partially surrounding the cylinder (1) and forming an annular space (12) between the container (6) and the cylinder (1), controllable damping means (18) having damping fluid flow passages (15, 17) connecting the two working chambers (7, 8) through wall openings (14, 16) of the cylinder (1), said passages (15, 17) being formed by the annular space (12) between the container (6) and the cylinder (1) and a sealing (13) dividing the annular space (12) into two areas (15, 17) each of which is connected through at least one of the wall openings to one of the working chambers (7, 8).

4,960,189

SERPENTINE-SHAPED SPRAG RETAINER OF A SPRAG-SYNCHRONIZED ONE-WAY CLUTCH

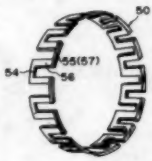
Hirofumi Ogata, Chigasaki, and Noboru Kitamura, Fujisawa, both of Japan, assignors to NSK-Warner Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 8, 1988, Ser. No. 281,428

Claims priority, application Japan, Dec. 8, 1987, 62-186857[U]

Int. Cl.[5] F16D *41/07*

U.S. Cl. 192—41 A 7 Claims



1. A one-way clutch assembly, comprising:

a plurality of sprags having a predetermined shape and arranged circumferentially along an annular space defined between an inner ring and an outer ring; and

a pair of inner and outer sprag retainers for retaining said plurality of sprags in position in said annular space spaced apart from each other, at least on of said inner and outer sprag retainers being fabricated from a plastic material and including a plurality of axial sections arranged circumferentially at a predetermined pitch and a plurality of circumferential sections each of which connects corresponding ends of two adjacent ones of said plurality of axial sections alternatively on each side to thereby define a serpentine-like cylindrical structure, said at least one retainer further including a flange which is integrally formed with and projecting radially over a predetermined length such that at least one retainer is resiliently held to said inner or outer ring when fitted thereon.

4,960,190

FLUID PRESSURE CLUTCH

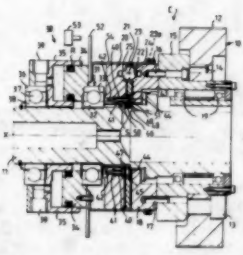
David J. Fortune, Bath, and David E. Wright, Wiltshire, both of United Kingdom, assignors to 501 British Autogard Limited, Meysey Hampton, England

Continuation-in-part of Ser. No. 209,963, Jun. 22, 1988, abandoned, which is a continuation-in-part of Ser. No. 106,629, Oct. 8, 1987, abandoned. This application Sep. 29, 1988, Ser. No. 251,133

Claims priority, application United Kingdom, Oct. 1, 1987, 8723038; May 25, 1988, 8812403

Int. Cl.[5] F16D *25/08, 43/20*

U.S. Cl. 192—56 F 19 Claims



1. A clutch comprising a pair of relatively rotatable and axially movable drive members, each having torque transmitting abutments, a fluid pressure biasing means to bias the drive members axially towards each other so as to be disengagably connected in torque transmitting relationship by a plurality of rotatable torque transmitting elements interposed between the drive members and which are biased into torque transmitting relationship with the torque transmitting abutments by the biasing means when the clutch is engaged and which are movable out of torque transmitting relationship with the torque transmitting abutments, a relieving means to relieve the fluid pressure of said biasing means, a cage to guide the torque transmitting elements, means to mount the cage between said drive members for free rotation relative thereto during disengagement of the clutch,

(a) means to maintain the cage spaced further from one of said drive members when the clutch is disengaged than when the clutch is engaged and

(b) drive member biasing means to move the drive members apart when the clutch is disengaged to provide a separation between the parts of the drive members which are engagable by the torque transmitting elements which is greater than the diameter of the torque transmitting elements

to maintain the torque transmitting elements out of engagement with the torque transmitting abutments of said one drive member when the clutch is disengaged.

4,960,191

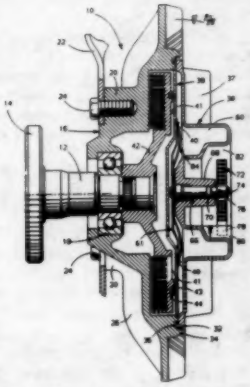
PRELOADED CONTROL ARM FOR A VISCOUS FLUID CLUTCH

Harvey J. Lambert, West Milton, and Lawrence C. Kennedy, Kettering, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Sep. 8, 1989, Ser. No. 404,536

Int. Cl.[5] F16D *35/00*

U.S. Cl. 192—58 B 2 Claims



1. An assembly for controlling the flow of fluid in a viscous fluid clutch to vary the speed of an attached fan, wherein the clutch includes a pump plate for separating a fluid reservoir from a shear zone, and a plurality of orifices in the pump plate, the assembly comprising:

(a) a rotatable control shaft mounted in the clutch;

(b) means for selectively rotating the control shaft connected to the shaft;

(c) a rotatable control arm having a central planar portion drivingly connected to the control shaft and flexible planar end portions slidable against the pump plate to selectively cover the pump plate orifices upon rotation of the control shaft to prevent fluid flow through the orifices; and

(d) rotatable spring means having a central planar portion

drivingly connected to the control shaft and flexible arcuate portions terminating in reduced-width contact areas placed in contact with the control arm end portions directly opposite the pump plate orifices for maintaining a seal at the orifices by the flexible control arm end portions when the control arm is rotated so that the control arm end portions cover the orifices.

4,960,192

HUB CLUTCH

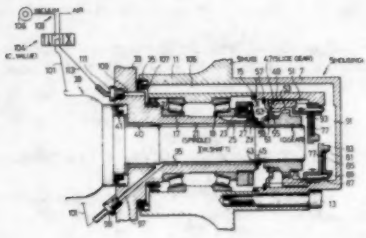
Sakuo Kurihara, Tochigi, Japan, assignor to Tochigifujisangyo Kabushiki Kaisha, Japan

Filed Jan. 3, 1989, Ser. No. 293,056

Claims priority, application Japan, Jan. 11, 1988, 63-2424; Jan. 21, 1988, 63-9678

Int. Cl.[5] F16D *25/061*; B60K *23/08*

U.S. Cl. 192—67 R **4 Claims**



1. A hub clutch for selectively coupling or decoupling a wheel drive shaft to or from a clutch housing formed with a hub portion, comprising:

(a) a drive gear fixed to an outer circumferential portion of the wheel drive shaft;

(b) a slide gear axially slidably coupled to an inner circumferential portion of the clutch housing;

(c) a movable member fixed to said slide gear so as to partition an inner space of the clutch housing into an inner enclosed chamber and an outer enclosed chamber;

(d) means for supplying pressure into said inner and outer enclosed chambers;

(e) a control valve, connected between the clutch housing and said pressure supplying means, for momentarily applying the pressure of said pressure supplying means into the inner chamber and atmospheric pressure into the outer chamber to engage said slide gear with said drive gear, and for applying the pressure of said pressure supplying means into the outer chamber and atmospheric pressure into the inner chamber to disengage said slide gear from said drive gear; and

(f) a check mechanism for locating the slide gear in the respective engagement or disengagement positions, the pressure of said pressure supplying means applied into the inner and outer chambers being released and the chambers being opened to atmospheric pressure at the respective engagement or disengagement positions of said slide gear mechanism to protect the inner and outer chambers from external contaminants.

4,960,193

CONCENTRIC SLAVE CYLINDER

Bobby L. Hodge, Matthews, N.C., assignor to Ina Bearing Company, Inc., Fort Mill, S.C.

Filed Jan. 27, 1989, Ser. No. 302,667

Int. Cl.[5] F16D *23/14, 25/08*

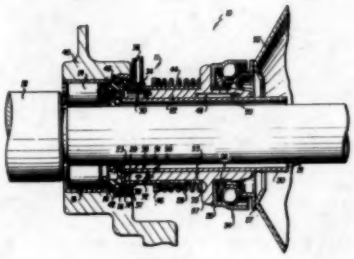
U.S. Cl. 192—91 A **19 Claims**

1. A drive decoupling apparatus for use with an input drive shaft extending into a main housing containing a diaphragm spring operated clutch associated with a driven mechanism, comprising:

(a) a bearing housing adapted to be carried by said main housing;

(b) bearing means within said bearing housing for supporting said input drive shaft;

(c) a clutch slave cylinder including means circumjacent said drive shaft for defining an annular cylinder and an annular piston slidably received in said annular cylinder;



(d) hydraulic pressure means for axially pushing said annular piston to decouple said clutch; and

(e) a release bearing assembly interposed between said annular piston and said diaphragm spring, said release bearing assembly being adapted to facilitate relatively unrestricted rotation between said piston and said diaphragm spring;

wherein said bearing housing further includes means for attaching said clutch slave cylinder thereto independently of said main housing to form a unitized cartridge-like assembly.

4,960,194

CENTRIFUGAL CLUTCH

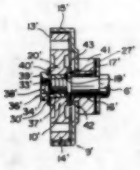
Akira Sageshima, Kunitachi; Tadashi Ozaki, Yokosuka; Hirozi Kawasaki, Fussa, and Isao Masuda, Tachikawa, all of Japan, assignors to Kioritz Corporation, Tokyo, Japan

Filed Feb. 8, 1989, Ser. No. 307,546

Claims priority, application Japan, Feb. 23, 1988, 63-38649; Feb. 23, 1988, 63-21897

Int. Cl.[5] F16D *43/18*

U.S. Cl. 192—103 B **2 Claims**



1. A centrifugal clutch of the type that includes a clutch boss member mounted on a driving shaft, a clutch drum mounted on a driven shaft, and clutch shoes movably connected to said clutch boss member and capable of being friction-engaged with said clutch drum, said clutch boss member having a central hole into which said driving shaft is inserted, one end surface of said clutch boss member abutting against a section of said driving shaft, said clutch boss member having in the central hole thereof a guide hole section into which a sleeve-like nut is fitted from the side of the other end of said clutch boss member in such a manner as to be brought into matching or slightly forced engagement therewith, a screw section formed on said driving shaft and a screw section formed in said sleeve-

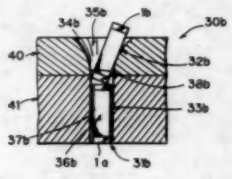
like nut being brought into engagement with each other, and a large-diameter end section formed on said sleeve-like nut abutting against said other end surface of said clutch boss member.

4,960,195

COMPONENT-ORIENTING APPARATUS

Masami Yamaguchi, and Masatoshi Arishiro, both of Kyoto, Japan, assignors to Murata Manufacturing Co., Ltd., Japan

Filed Nov. 30, 1988, Ser. No. 278,226
Claims priority, application Japan, Nov. 30, 1987, 62-304015
Int. Cl.[5] B65G *47/24*
U.S. Cl. 193—44 **5 Claims**



1. A component-orienting apparatus provided with a plurality of parallel orienting passages for aligning in the same orientation as each other a plurality of rectangular-parallelopidpedic components each having longitudinal, crosswise and perpendicular dimensions that are orthogonal to each other, wherein said longitudinal dimension has the longest size;

each of said orienting passages comprising:

a receiving portion provided with a first space defined by a first inner peripheral surface with an upwardly-taperingly opening; and

an aligning portion having a cylindrical second inner peripheral surface defining a second space communicating with the lower end of said first space provided in said receiving portion, sectional geometry of said second inner peripheral surface being so selected as to reject said longitudinal dimension of each said component but to crosswisely and perpendicularly orient said component in predetermined respective directions

said first and second spaces having elliptic sectional configurations;

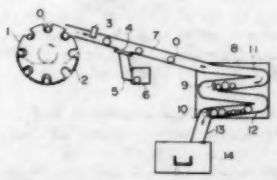
said first inner peripheral surfaces being continuous with said second inner peripheral surface through a rounded face lacking a sharp edge, and further being similar in sectional configuration to said second inner peripheral surface.

4,960,196

AUTOMATIC TOLL COLLECTOR

Koichi Kanehara, and Kazumi Fukuda, both of Hyogo, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 15, 1989, Ser. No. 312,836
Claims priority, application Japan, Feb. 17, 1988, 63-19442[U]
Int. Cl.[5] G07F *1/04, 9/08*
U.S. Cl. 194—215 **1 Claim**



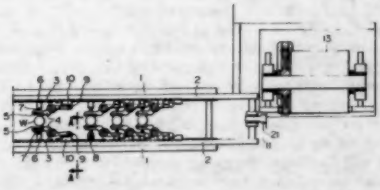
1. An automatic toll collector of the throw-in type for installation on toll roads, parking places, and other toll gates so that a driver can pay a toll while sitting in a driver's seat, comprising a large hopper for receiving coins thrown by a user, a distinguishing sensor for distinguishing between counterfeit coins and genuine coins from among coins thrown in the hopper and identifying the kinds of coins, a counting device for counting coins thrown in the hopper to calculate the amount of the coins after genuine coins are distinguished by said distinguishing sensor, a counterfeit coin discharging device for discharging the counterfeit coins to return to the user when the counterfeit coins are distinguished by said distinguishing sensor, a temporary holding device for temporarily holding the coins thrown in the hopper where the user can visually see the coins until new coins have been thrown into the hopper by a succeeding automobile, said holding device having an upper portion and a lower portion each for holding a plurality of coins, a cash box, means for advancing the coins down along the upper portion holding device into the lower portion to be held in the lower portion and to drop the coins held in the lower holding portion into the cash box so that coins received from the next user can be held in the upper portion when the amount of coins counted by said counting device exceeds a set value, characterized in that said holding device comprises a passage formed of transparent material including a groove having a width and having a thickness larger than a maximum thickness of coins currently in use and smaller than double the thickness of the coins of minimum thickness currently in use, said passage meandering with two folds in the upper portion and two folds in the lower portion, said portions having lower ends, said folds each having a terminus and each having a lane inclined in the same direction as the other fold, a pair of shutters each disposed in a lower end of each of the two portions at a terminus of each lane inclined in the same direction to stop the drop of coins temporarily, an upper detaining portion and a lower detaining portion each forming a part of one of said shutters for temporarily detaining coins in said folds until said counting device determines when the amount of coins in the upper detaining portion reaches a predetermined amount and for opening said two shutters so that the coins in the lower detaining portion are dropped in said cash box and coins in the upper detaining portion are moved to said lower detaining portion to be detained therein.

4,960,197

FINGER ACTUATING DEVICE IN A TRANSFER PRESS

Hiromichi Takao, Seto, Japan, assignor to Asahi-Seiki Manufacturing Co., Ltd., Japan

Filed Mar. 13, 1989, Ser. No. 322,163
Claims priority, application Japan, Mar. 16, 1988, 63-35055[U]
Int. Cl.[5] B65G *25/00*
U.S. Cl. 198—621 **1 Claim**



1. A finger actuating device in a transfer press, in which workpieces to be processed are successively transferred through a plurality of stations disposed at predetermined intervals, comprising:

a pair of transfer slides extending substantially in parallel to each other and arranged to make an intermittent reciprocating movement in the longitudinal direction;

guide ways positioned longitudinally on said transfer slides, respectively;

a pair of actuating bars supported on said pair of transfer slides in such a manner as to be movable along said guide ways;

an actuating bar driving means adapted to move said actuating bars in such a manner that said actuating bars move synchronously with said transfer slides and that said actuating bars move longitudinally and relative to said transfer slides when said transfer slides dwell;

a plurality of pairs of finger members having respective finger tools for holding workpieces to be processed and arranged opposite to each other on said transfer slides at intervals corresponding to said predetermined intervals between said stations so as to perform opening/closing operation of said finger tools for releasing and engaging the workpieces to be processed with said finger tools, each of said finger members consisting of a lever member which has a middle portion pivoted to one of said transfer slides by means of a vertical pin and has at one end thereof said finger tool and at the other end thereof a roller;

spring loaded members adapted to urge said finger members normally to perform the closing operation of said finger tools; and

a plurality of finger actuating cams having rises individually contoured and arranged on said actuating bars at intervals substantially equal to those between said stations in such a manner that the longitudinal position of each said cam relative to said actuating bar is adjustable and that said cams are adapted to engage with said associated rollers of said finger members to perform the opening operation of said finger tools as said actuating bars move relative to said transfer slides.

4,960,198

RECIPROCAL CONVEYOR CARRIAGE FOR SPACING GROUPS OF CANDY

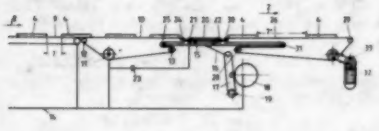
Hogenkamp Wilhelm, Hanover, Fed. Rep. of Germany, assignor to Otto Hänsel GmbH, Hanover, Fed. Rep. of Germany

Filed Jun. 7, 1989, Ser. No. 362,879

Claims priority, application Fed. Rep. of Germany, Jun. 7, 1988, 3819348

Int. Cl.[5] B65G *47/31*

U.S. Cl. 198—419.2 **12 Claims**



1. A conveyor comprising: a first belt operated at a first speed for transporting candy pieces distributed in first rows spaced from each at a predetermined first interval, said first rows extending transverse to the direction of motion of said first belt; a second belt operated at a second speed differing from said first speed for transporting candy pieces distributed in second rows spaced from each other by a predetermined second interval variable in relation to said first interval; a driven reciprocable carriage, said first belt and said second belt having facing reverse deflecting sides positioned on said carriage and forming a migrating transfer location; a third auxiliary belt on said carriage between said two deflecting sides and having drive means shiftable between two auxiliary speeds dependent on the direction of motion of said carriage; said first rows of candy pieces on said first belt being arranged in first groups of rows, adjacent groups of said first groups of rows being separated by a first distance; said second rows of candy pieces on said second belt being arranged in second groups of rows, adjacent groups of said second groups of rows being separated by a second distance that is greater than said first distance; said drive means operating said auxiliary belt at said first speed for transfer of said first groups to said auxiliary belt, said drive means operating said auxiliary belt thereafter at said second speed for transfer said groups on said auxiliary belt to said second belt.

4,960,199

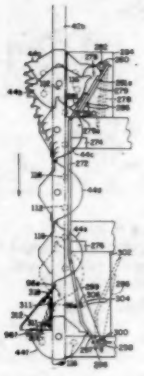
BUCKET DISTRIBUTION SYSTEM

Jimmie F. Lassiter, Jr., and David R. Slager, both of San Antonio, Tex., assignors to Meyer Machine Company, San Antonio, Tex.

Filed Jan. 5, 1990, Ser. No. 461,235

Int. Cl.[5] B65G *45/10*

U.S. Cl. 198—494 **3 Claims**



1. A bucket distribution system for receiving products and discharging said products at a plurality of distribution stations, comprising:

a frame for supporting a plurality of buckets adapted to receive said products;

chain drive means for moving said buckets in a closed path;

first means for pivoting each of said buckets at said discharge station, said pivoting means causing said buckets to pivot in a direction opposite to the direction of bucket travel;

means hingedly connected to said frame adapted to be pivoted so as to expose said chain drive means;

second means for pivoting said buckets so as to facilitate cleaning thereof; and

a shield adapted to be removably connected to said frame during cleaning of said buckets.

4,960,200

CONVEYER BELT CLEANING AND SANITIZING APPARATUS

Christopher R. Pierce, Oakland, Calif., assignor to Mepaco, Inc., Oakland, Calif.

Filed Aug. 4, 1989, Ser. No. 389,491

Int. Cl.[5] B65G *45/22*

U.S. Cl. 198—495 **7 Claims**

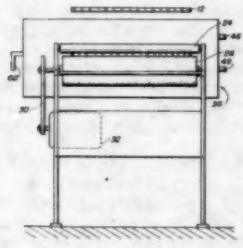
1. Apparatus for cleaning and sanitizing the conveying surface of a conveyor belt moving along a predetermined path of movement, said apparatus comprising, in combination,

a framework disposed along said predetermined path of movement;

debris-removal means attachable to said framework for engaging said conveying surface and removing debris from said conveying surface;

scrubber means attachable to said framework downstream from said debris removal means, said scrubber means including a housing defining an interior and openings

disposed along said path of movement to permit passage of said conveyor belt through said interior, applicator means for applying a cleaning agent to said conveyor belt when said conveyor belt is in said interior, and brush means for brushing said conveyor belt substantially simultaneously with the application of said cleaning agent, said brush means comprising brush mounting means, a plurality of rotary brushes rotatably mounted on said mounting means with at least one rotary brush disposed adjacent the



conveyor surface side of the conveyor belt and at least one rotary brush disposed adjacent to the side of the conveyor belt opposed to said conveyor surface side, drive means comprising an air motor operatively associated with each brush and means for delivering compressed air to said air motors, and means for selectively moving said mounting means relative to said conveyor belt to bring said rotary brushes into engagement with said conveyor surface side and the opposed conveyor side.

4,960,201

AUTOMATIC DUMP ACTUATOR CONVEYOR SYSTEM

Keith G. Opperthauser, Linden, Mich., assignor to Automated Systems, Inc., Pontiac, Mich.

Filed Aug. 10, 1988, Ser. No. 230,497
Int. Cl.[5] B65G *19/26*
U.S. Cl. 198—732 **4 Claims**

1. A conveyor system comprising:

workpiece transporting means for moving workpieces along said conveyor system;

continuously driven endless moving belt means in a spaced relationship with said workpiece transporting means such that said endless moving belt means is substantially positioned directly below said transporting means; and

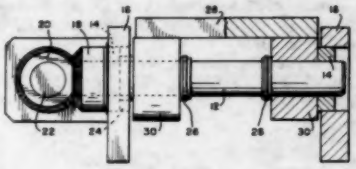
means coupled with said endless belt means in a spaced relationship with said workpiece transporting means for driving workpieces along said workpiece transporting means said driving means including one or more drivers, each having a bearing means adapted to contact the workpiece between the transporting means and the endless moving belt means to drive the workpiece along said transporting means and each driver having a gravitational counterbalance means for maintaining said bearing means in a first position in contact with said workpiece and enabling said bearing means to move to a second position out of contact with said workpiece when movement of said workpiece is stopped, said counterbalance means causing said bearing means to position to said first position after said bearing means moves past said stopped workpiece and no longer engages any workpiece.

4,960,202

FRICTION CONTROL FOR BEARING SURFACE OF ROLLER

Edwin E. Rice, Ann Arbor, and Hugh R. Norris, Howell, both of Mich., assignors to Ingersoll-Rand Company, Woodcliff Lake, N.J.

Continuation of Ser. No. 3,135, Jan. 14, 1987, abandoned. This application May 17, 1989, Ser. No. 355,813
Int. Cl.[5] B65G *13/06*
U.S. Cl. 198—781 **2 Claims**



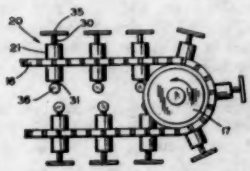
1. A friction drive roller for a continuously rotating axle of a conveyor comprising: an annular roller element having an outer diameter surface for rollingly transporting articles on the conveyor and an inner diameter surface for frictional drive contact with the rotating axle; means for reducing the coefficient of friction between said inner diameter surface and said rotating axle when said articles are restrained from movement on the conveyor comprising a small gap between the rotating axle and the inner diameter surface of the roller element and a film of lubricant disposed in the gap so as to substantially prevent the rotating axle from contacting the inner diameter surface; and means for increasing the coefficient of friction between said inner diameter surface and said rotating axle when said articles are free to move on the conveyor comprising a continuous helical groove having circumferential loops spaced three to ten groove widths apart in one of said inner diameter surface and said rotating axle for reducing the lubricant pressure so as to allow frictional drive contact of the rotating axle with the inner diameter surface.

4,960,203

ADJUSTABLE HEIGHT ARTICLE SUPPORTING MECHANISM

Andrzej J. Kalazny, Wyomissing, Pa., assignor to Dana Corporation, Toledo, Ohio

Filed Aug. 7, 1989, Ser. No. 390,536
Int. Cl.[5] B65G *17/32*
U.S. Cl. 198—802 **17 Claims**



1. A mechanism for adjustably supporting an article at a fixed position relative thereto comprising:

a cylinder defining an interior;

a movable piston disposed in said cylinder interior, said

piston dividing said cylinder interior into upper and lower chambers;

valve means disposed in said piston for selectively permitting fluid communication between said upper and lower chambers, said valve means being normally closed to maintain said piston at a fixed position within said cylinder and opening only when the pressure differential exerted thereacross exceeds a predetermined value to permit movement of said piston within said cylinder; and

means connected to said piston and extending out of said cylinder for engaging and supporting an article at the fixed position.

4,960,204

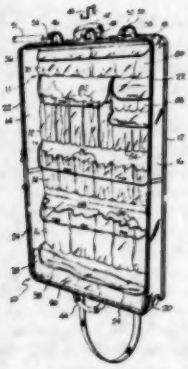
CARRY-ON TRAVEL BAG FOR COSMETICS

Ilsa A. Young, 6380 Snowbird Dr., Colorado Springs, Colo. 80918, and Doris K. Roberts, 10 Woodmen La., Colorado Springs, Colo. 80919

Filed Sep. 2, 1988, Ser. No. 239,772

Int. Cl.[5] A45D *33/00, 43/00, 44/18;* **A45C** *13/00*

U.S. Cl. 206—235 **18 Claims**



1. A flexible travel bag for holding personal care items such as cosmetics and accessories while hanging in a vertical fully extended open position and in a closed folded carrying and storage position comprising:

a relatively large size main storage compartment means made of flexible foldable material and having a generally rectangular peripheral configuration and having a main flat outer side wall portion, an upper peripheral outer wall portion, a pair of spaced peripheral outer side wall portions and a bottom peripheral outer wall portion defining a main storage compartment;

a main compartment closure means mounted along said upper peripheral outer wall portion and along said spaced peripheral outer side wall portions of said main storage compartment means and along said bottom peripheral outer wall portion for closing said main storage compartment means in said closed, folded position while enabling movement between said open position and said closed folded position;

hanger means mounted along said upper peripheral outer wall portion for hanging the bag in the vertical fully extended open position;

a plurality of relatively small size generally rectangular separate secondary storage compartment means mounted in said main storage compartment means for holding and storing a plurality of different types of relatively small size items, each secondary storage compartment means having a back wall portion, a front wall portion, a pair of laterally spaced closed side portions, a closed lower side portion and an opening on the upper side portion which faces upwardly in said vertical fully extended open position;

said secondary storage compartment means having a plurality of different sizes and shapes and being arranged in a plurality of vertically spaced rows extending laterally across said main flat side wall portion between said pair of spaced peripheral outer side wall portions;

cover means for selectively covering and uncovering the open upper side portion of said relatively small size secondary storage compartment means and being movable between an open access position and a closed position relative to said secondary storage compartment means;

handle-type carrying means for carrying said bag by hand in the folded carrying and storage position and being fixed to said main storage compartment means and being positioned and located along said upper peripheral outer wall portion in the folded carrying and storage position;

and wherein said secondary storage compartment means comprising:

a main support sheet of plastic material fastened to said main flat outer side wall portion and having a length and width approximately equal to the length and width of said main flat outer side wall portion and forming said back wall portion of each of said secondary storage compartment means; and

a plurality of separate sheets of plastic material fastened to said main support sheet of plastic material extending laterally thereacross and having a length equal to the width of said main support sheet of plastic material and a width equal to the height of said secondary storage compartment means and forming said front wall portion and said side portions and said lower side portion of each of said secondary storage compartment means.

4,960,205

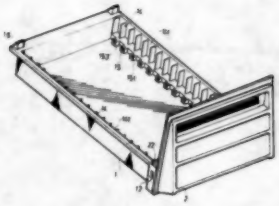
MULTIPURPOSE STORAGE CASE

Bor-Jou Wang, 3/F No. 740, Ching Chen Road, Yung-Ho Taipei Hsien, Taiwan

Filed Oct. 16, 1989, Ser. No. 422,274

Int. Cl.[5] B65D *85/612*

U.S. Cl. 206—387 **2 Claims**



1. A multipurpose storage case including:

a casing comprising a pair of connecting ends bilaterally disposed at the front opening for connection thereto of a handle, said connecting ends each comprising a vertical slot with a notch transversely piercing through both sides thereof, two platforms upstanding from the bottom surface thereof at both sides, a plurality of division plates equidistantly mounted on each of said two platforms to respectively define therebetween a plurality of upper receiving spaces, said platforms each comprising unitarily a plurality of projecting blocks horizontally extending therefrom toward the center portion of the bottom surface of said casing and defining therebetween a plurality of lower receiving spaces, said projecting blocks each comprising a notch made therein in the middle; and

a handle comprising two trapezoid blocks bilaterally made on the back side to respectively set in the notches of the two vertical slots of said two connecting ends of said

casing, and an elongated strip horizontally disposed at the back side above said two traperzoid blocks.

4,960,206

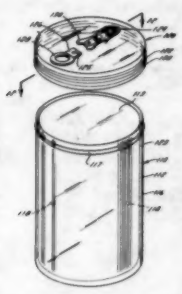
SYSTEM FOR PACKAGING A PRODUCT AND FOREWARNING CONSUMERS IF THE PACKAGE HAS BEEN TAMPERED WITH

Wayne N. Johannes, Madison, Wis., assignor to Vac-Puff Corporation, Madison, Wis.

Continuation-in-part of Ser. No. 856,227, Apr. 28, 1986, abandoned. This application Oct. 17, 1986, Ser. No. 920,150

Int. Cl.[5] B65D *73/00*

U.S. Cl. 206—459 **7 Claims**



1. A package for containing a product comprising:

an inner container for holding a product within the package;

an outer container of gas-impervious material surrounding and spaced apart from said inner container whereby a space is defined between said inner and outer containers;

a vacuum within said space;

an aperture in said outer container extending through the surface of said outer container to communicate with said space;

means sealing said aperture, whereby the vacuum is maintained in said space; and

means for removing said sealing means from said aperture to produce an audible signal or puff of air entering said space through said aperture and wherein spacer means are located within said space to ensure a spacial relationship between said inner and outer container.

4,960,207

BAKERY TRAY WITH BLIND STACKING AND UNSTACKING

Charles P. Tabler, Hamilton, and Eric D. Stein, Batavia, both of Ohio, assignors to Buckhorn, Inc., Milford, Ohio and EKCO/GLACO, Inc., Humboldt, Tenn.

Continuation-in-part of Ser. No. 274,500, Nov. 21, 1988. This application Apr. 14, 1989, Ser. No. 338,300

Int. Cl.[5] B65D *21/04*

U.S. Cl. 206—507 **21 Claims**

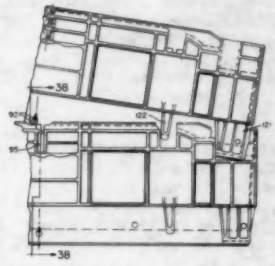
1. A container, for stacking with a plurality of like containers, wherein the container has at least a bottom and end walls, with the end walls having interengaging feet and recesses when two like trays are stacked, the improvement comprising:

at least one projection on the midportion of each said end wall;

at least one recess in the midportion of each said end wall for receiving therein with generally vertical telescoping relative movement, the corresponding projection of a like stacked container;

said feet and recesses at one side of like stacked containers providing first pivot means for pivoting the top one of the stacked containers generally about an axis at said one side sufficiently for said feet and recesses at the other side to become completely vertically disengaged and sufficiently for said projections and recesses in the midportion of said end walls to become completely vertically disengaged at pivoted angles of said containers above a generally fixed threshold angle, and said pivot means providing lost motion in generally the horizontal direction parallel to said end walls and in the direction from said first pivot means toward said midportion sufficiently to vertically misalign said projections and their adjacent recesses at said pivoted angles to where said containers assume a pivoted misaligned position;

support means on said end walls for supporting said projections outside of their recesses when said other sides of said containers are relatively pivoted towards each other from said pivoted misaligned position and constituting second pivot means for thereafter relatively pivoting said containers with respect to each other from pivot angles to a generally parallel relative position about said projections; and



means for supporting the top one of said like containers on said end walls of the bottom one of said containers in said parallel relative position and providing generally horizontal sliding bearing surfaces to continue said supporting as said top one of said containers is slid horizontally in said direction for a substantial distance to where a substantial portion of the other side of a lower adjacent container to provide a greater portion of the top one of said containers for the user to grasp, whereby the containers may be unstacked while grasping only a side of the top container for moving it to an unstacked and horizontally misaligned position where a greater portion of the top container is available for grasping.

4,960,208

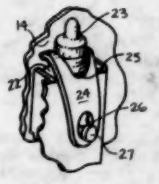
EYEGLASS CASE KIT

Linda M. Tempke, P.O. Box 880, 1176 Gold Mt. Dr., Big Bear City, Calif. 92314

Filed Nov. 22, 1989, Ser. No. 440,335

Int. Cl.[5] A45C *11/04*

U.S. Cl. 206—581 **9 Claims**



1. An eyeglass case kit comprising a case including a for-

ward wall, a rear wall, a right side wall, and a left side wall, and

a covering flap pivotally mounted to an upper edge of the rear wall and pivotal from a first extended open position to a second covering position overlying the forward wall including a hook and loop fastening patch mounted to an interior surface of the flap, and

a plurality of pockets fixedly mounted to an exterior surface of the forward wall and of a length positioned below an upper edge of the forward wall, and

including a further hook and loop fastening patch mounted on an exterior surface of one of said pockets to selectively engage said hook and loop fastening patch of the covering flap,

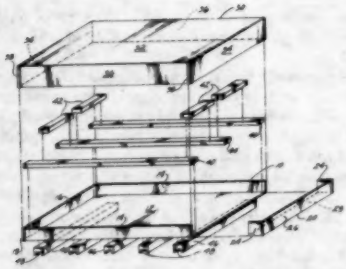
wherein the plurality of pockets comprise two pockets with a first pocket, and a fabric cloth, and the fabric cloth selectively mounted within the first pocket, and a spray bottle, and the spray bottle selectively mounted within the second pocket, and the second pocket including an orthogonally outwardly extending securement boss wherein the securement boss includes an enlarged head, and the second pocket further includes a securement flap positioned rearwardly of the second pocket and engageable with the securement boss.

4,960,209

SHEET STEEL PACKAGE ASSEMBLY

Ernest C. Tudor, Highland, Calif., assignor to California Steel Industries, Inc., Fontana, Calif.

Filed Mar. 16, 1989, Ser. No. 324,582
Int. Cl.[5] B65D *19/06, 6/00*
U.S. Cl. 206—597 **18 Claims**



1. A sheet steel packaging arrangement comprising:

a rectangular tray for receiving a plurality of sheets of steel, the tray having a bottom, an open top, a plurality of enclosed sides and at least one open side;

a top cover slidably engaging the tray for completely enclosing the open portions of the tray; and

at least one L-shaped side cover, each such side cover slidably engaging the bottom and an open side of the tray for enclosing each open side of the tray and fitting inside the top cover.

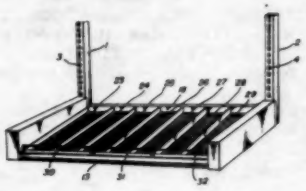
4,960,210

GRAVITY FEED GONDOLA BASE

William S. Spamer, Roswell, Ga., assignor to The Mead Corporation, Dayton, Ohio

Filed Jun. 29, 1989, Ser. No. 373,384
Int. Cl.[5] A47F *7/00*
U.S. Cl. 211—59.2 **10 Claims**

1. A gravity feed gondola base arranged for placement with a pair of horizontal parallel gondola support beams connected respectively to a pair of vertical gondola posts, said base comprising an inner and an outer shoe box enveloping each of said support beams, an inwardly projecting support tab struck from each of said inner shoe boxes, a rear cross beam secured at its ends respectively to said support tabs, an inwardly projecting support strip secured to each of said inner shoe boxes at a level below said support tabs, a front cross beam secured at its ends



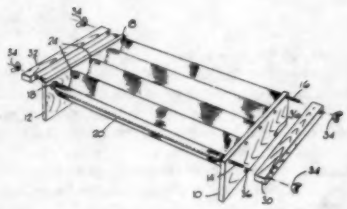
respectively to said support strips, low friction means mounted on said rear cross beam and said front cross beam for slidably supporting articles displayed thereon, and article arresting means mounted on said front cross support.

4,960,211

VARIABLE RACK FOR RISING BREAD DOUGH

Almonte F. Bailey, 3115 Loma Verde Dr. #34, San Jose, Calif. 95117

Filed Jul. 24, 1989, Ser. No. 384,567
Int. Cl.[5] A47F *5/00*
U.S. Cl. 211—60.1 **3 Claims**



1. A variable rack for rising bread doughs, the variable rack comprising:

a pair of spaced apart parallel end supports;

a pair of end support rods removably connected to said end supports for maintaining said end supports in a spaced apart parallel position;

canvas means having a smooth upper surface and having a plurality of rod channels provided on a bottom surface thereof;

a plurality of intermediate support rods removably connected between said pair of end supports and which, together with said pair of end support rods, are selectively arranged to support said canvas means between said pair of end supports by passing them through selected ones of said rod channels to provide a selected number and size of cradles in said canvas means, each of said cradles being operative for supporting a rising bread dough.

4,960,212

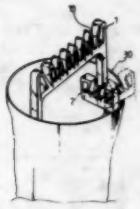
GOLF CLUB REST FOR GOLF BAG

Chun S. Wu, No. 23, Shin Yih South Rd., Tainan, Taiwan

Filed Sep. 27, 1989, Ser. No. 413,031
Int. Cl.[5] A47F *7/00*
U.S. Cl. 211—70.2 **3 Claims**

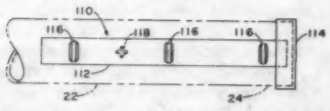
1. A golf club support for a golf bag comprising in combination, a golf bag having an open end, a main frame supported at the open end of the golf bag, said main frame comprising a plurality of dividers defining spaces therebetween for receiving golf clubs, and an auxiliary frame supported at the open end of the golf bag, said auxiliary frame also having a plurality

of dividers defining spaces therebetween for receiving golf clubs, said auxiliary frame being rotatable with respect to said



golf bag so as to be selectively movable between operative positions inside and outside said golf bag.

4,960,213
HANGER SUPPORT GUARD
William Pfeifer, Springdale, Pa., assignor to Armstrong Store Fixture Coporation, Pittsburgh, Pa.
Filed Apr. 14, 1989, Ser. No. 338,161
Int. Cl.[5] A47F 5/00
U.S. Cl. 211—123 **11 Claims**



1. A support guard for protecting the exposed surface of a hanger support from being scratched by a hanger, comprising:

a strip having a bottom surface and an upper surface, the bottom surface adapted to be superposed upon less than about half of the surface of a hanger support, with at least one hollow peg having sidewalls extending upwardly from the upper surface of the strip to a top wall; and

locking means formed with the strip as a single piece and extending from the top wall of the peg to below the bottom surface of the strip, the locking means being separate spaced from the sidewalls of the peg, the locking means adapted for friction-fitting engagement with the hanger support.

4,960,214
CASSETTE STORAGE BASKET
Richard C. Sayers, Opelika, Ala., assignor to Ampex Corpration, Redwood City, Calif.
Filed Sep. 12, 1988, Ser. No. 243,355
Int. Cl.[5] A47F 7/00
U.S. Cl. 211—133 **6 Claims**

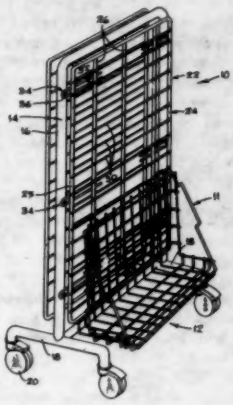
1. A cassette storage basket, suitable for carrying a plurality of cassettes, and mountable on a complementary storage hanger provided on a fixed hanger support member, the basket comprising:

a support frame open at the front for receiving cassettes, with a bottom wall, an interconnected rear wall, and side brackets at respective ends of the walls connected to the support frame to define the framework of the basket;

the support frame comprising a rectangular frame defining the open front of the basket with handles provided in the frame at the sides thereof,

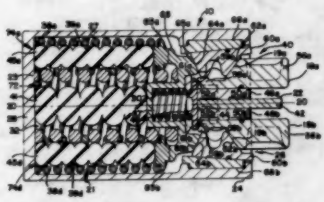
at least one hook provided at an upper end of the rear wall; and

at least one rearwardly extending abutment mounted at a lower end of the rear wall, with the engagement of the hooked portion with a complementary storage hanger and the engagement of the elbow portion with the hanger



support member maintaining the basket in at least a horizontal orientation.

4,960,215
FRICTION ELASTOMER DRAFT GEAR
Richard A. Carlstedt, Wheaton, Ill., assignor to Miner Enterprises, Inc., Geneva, Ill.
Filed Dec. 22, 1988, Ser. No. 288,663
Int. Cl.[5] B61G 9/08, 11/10
U.S. Cl. 213—33 **9 Claims**



1. A friction elastomer draft gear having a center line along its major axis and which when first tested generates impact forces below 500,000 lbs. when 70 ton rail cars are impacted at speeds of at least five miles per hour, which even after considerable energy input and wearing in of parts when second tested generates impact forces below 500,000 lbs. when 70 ton rail cars are impacted at speeds of at least five miles per hour comprising:

a hollow housing having a generally tubular body with a first open end and a second closed end including:

a friction plate centrally disposed along said major axis having a first end which extends out of said hollow housing and a second end situated down in said first open end;

first and second barrier plates disposed one on either side of said friction plate, said first and second barrier plates being anchored against longitudinal movement and responding to lateral pressure;

first and second friction wedges, said first friction wedge being disposed on one side of said first barrier plate and said second friction wedge being disposed on one side of said second barrier plate, each of said first and second friction wedges having first and second angled surfaces;

first and second shoes, said first shoe being disposed on one side of said first friction wedge and said second shoe being disposed on one side of said second friction wedge, each of said first and second shoes having first and second angled surfaces, said first angled means of said friction wedge means cooperating with said first angled means of said shoe means to define an angle with respect to said center line of about 53 degrees, plus or minus 2 degrees.

first and second wear liner plates, said first wear liner plate being disposed on one side of said first shoe and said second wear liner plate being disposed on one side of said second shoe and being anchored to said first open end against longitudinal and lateral movement;

a release wedge having a horizontally extending body portion and angle portions, said angle portions cooperating with second angle portions of said friction wedges to define an angle with respect to said center line of about 60 degrees, plus or minus 2 degrees;

a spring seat exerting force against said shoes and having angled portions cooperating with said second angled portions of said shoes to define an angle with respect to said center line of about 66 degrees, plus or minus 2 degrees;

a spring system disposed within said hollow housing adjacent said second closed end including:

a first series of coil springs having a center void portion, said center void portion being occupied by a first series of elastomer column spring; and

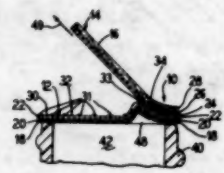
a second series of coil springs having center void portions, each of said center void portions being occupied by a second series of elastomer column springs.

4,960,216

PARTIALLY LAMINATED CLOSURE CAP FOR TAMPER PROOF CONTAINER AND METHOD OF MAKING SAME

Joseph M. Giles, Lexington, Ill., assignor to Selig Sealing Products, Inc., Forrest, Ill.

Filed Aug. 17, 1989, Ser. No. 394,867
Int. Cl.[5] B65D *51/20*
U.S. Cl. 215—232 **11 Claims**



1. A tamper indicating inner seal for a container having an opening, comprising:

a first heat-activated adhesive layer for securing said inner seal about said opening;

a second foil layer, one side of which is attached to said first heat-activated adhesive layer;

a third polyester film layer, one side of which is attached to another side of said foil layer;

a fourth heat resistant foam layer, one side of which is attached to another side of said third film layer;

a solid adhesive layer bonding a portion of said third polyester layer to said second foil layer, an area of bonding of which is less than 50% of a total area of said second foil layer; and

a pattern adhesive layer slightly bonding a remaining portion of said third polyester film layer to a remaining portion of said second foil layer, said pattern adhesive layer including a plurality of spaced apart adhesive droplets;

whereby to form a liftable tab for manipulation by the fingers of a user to remove the seal from the container and excluding any layer of moisture absorbing material such as kraft paper.

4,960,217

BALLOON-TYPE BOTTLE SEALER

Hsieh-Yih Teng, P.O. Box 10160, Taipei, Taiwan (30002)

Filed Sep. 19, 1989, Ser. No. 409,348
Int. Cl.[5] B65D *39/12*
U.S. Cl. 215—271 **1 Claim**

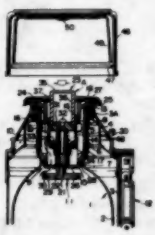
1. A bottle sealer made of elastomer materials sealably inserted in a bottleneck of a bottle comprising an inner round disk portion sealably inserted in the bottleneck, and a balloon extension formed in said inner round disk portion concave outwardly from said disk portion having an opening formed in said balloon extension in fluid communication with a liquid filled in the bottle, a height defined between a bottom surface of the disk portion and an outer edge of the bottleneck being larger than an expansion height of the balloon extension when the bottle and the balloon extension filled with the liquid are subjected to a volume expansion due to cold temperature, said bottleneck being inserted into a socket of a base or holder for a stable display purpose of the bottle.

4,960,218

PLUG BODY FOR A LIQUID CONTAINER

Shouji Toida; Kazunori Iwasaki; Toru Goto, and Shigeru Tsuchiya, all of Tokyo, Japan, assignors to Nippon Sanso Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 25, 1989, Ser. No. 426,220
Int. Cl.[5] B65D *51/00*
U.S. Cl. 215—311 **4 Claims**



1. A plug body for a liquid container comprising:

an operating button provided with long engaging elements and short engaging elements at its lower end, said operating button being movable freely in the vertical direction;

a rotatable slider having protrusions on its circumference, said protrusions alternatively making contact with said long engaging elements and short engaging elements;

an inner cylindrical member provided on an inner surface with vertical guide tracks that guide said long engaging elements and short engaging elements, and having guide

surfaces that guide said protrusions to said guide tracks with said rotatable slider rotating;

spring means for preloading said rotatable slider upwards so that said protrusions make contact with one of said long engaging elements, short engaging elements, and said guide surfaces; and

valve means connected to said rotatable slider, said valve means opening a liquid passage of the liquid container when said long engaging elements make contact with said protrusions, and closing the liquid passage when said short engaging elements make contact with said protrusions,

wherein said operating button protrudes above an upper lid of the plug body when said control valve means opens said liquid passage.

4,960,219

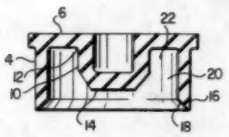
SNAP CAP

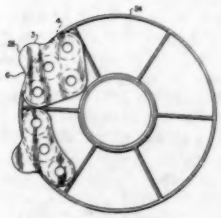
Willie W. Jordan, and Brian J. McGraw, both of Garland, Tex., assignors to Abbott Laboratories, Abbott Park, Ill.

Filed Sep. 8, 1989, Ser. No. 404,842

Int. Cl.[5] B65D *41/00*

U.S. Cl. 215—354 **20 Claims**





1. A snap cap apparatus for containers having necked openings comprising:

a plurality of caps, each cap defining an open chamber with an open end having wall thickness tapered from outside to inside, the caps being arranged and connected by a thin pliable cover which forms with the wall a closed end and in cooperation with the wall defines the chamber;

the caps having stopper elements concentrically positioned within the chamber, the stopper elements each having a base connected to the thin pliable cover and presenting a smaller tapered exposed end portion which is proximal to the open end of the chamber, the cap and stopper element defining an open ring portion for receiving container opening neck portions.

4,960,220

CONTAINER ASSEMBLIES CAPABLE OF RECEIVING AND MAINTAINING PLURAL TYPES OF WASTE MATERIALS SEPARATED FOR SEPARATE DISPOSAL OF EACH TYPE OF WASTE MATERIAL

Uriel G. Foa, 631 Righters Mill Rd., Penn Valley, Pa. 19072

Filed Jun. 9, 1989, Ser. No. 364,097

Int. Cl.[5] B65D *1/24*

U.S. Cl. 220—23.83 **25 Claims**

1. A container assembly capable of receiving and maintaining plural types of Waste materials in a separated form for separate disposal of each type of waste material, said assembly comprising:

(a) a first container comprising a given number of separate compartments;

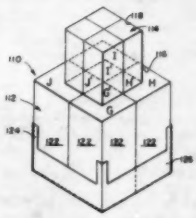
(i) said given number of separate compartments disposed in an array;

(ii) each of said compartments extending from a center of the container to the outer side and having an open top;

(b) a satellite container smaller than the first container, said satellite container having:

(i) an open top;

(ii) a plurality of separate compartments in an array within that satellite container corresponding in number to said given number;



(iii) a displaceable satellite cover means mounted on the top of the satellite container and adapted to close said open top; and

(c) means to guide and position the satellite container upside down over the first container so that each of the compartments of the satellite container can overlie a corresponding compartment of the first container so that upon displacement of the satellite cover means, the specific type of waste material in a given compartment of the satellite container is deposited into the corresponding compartment of the first container holding that same specific type of Waste material.

4,960,221

PRESSURE VESSEL

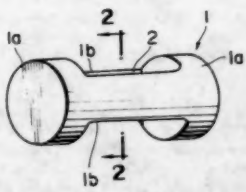
Eiichi Hirsoka, 50-17-A-13, Kamikitazawa-5-chome, Setagaya-ku, Tokyo, and Junji Onaka, 16-7, Kuboinari-4-chome, Irumashi, both of Japan

Filed May 26, 1989, Ser. No. 357,574

Claims priority, application Japan, Jun. 21, 1988, 63-81153[U]

Int. Cl.[5] B65D *53/02*

U.S. Cl. 220—3 **1 Claim**



1. A pressure vessel comprising a hollow cylindrical member and a cylindrical body section slidably fitted into said cylindrical member in an axial direction, said body section being formed as an integral member comprising disc-like end-wall sections provided at the ends of said body section and a middle section which is cut out along two planes substantially parallel to the axial direction and two planes substantially parallel to end-walls of said body section, thereby defining a

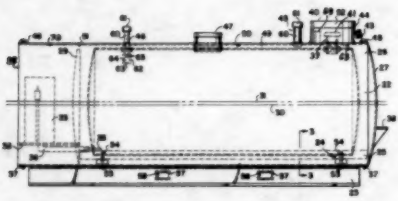
hollow section, wherein said hollow section comprises, in cross-section, a pair of substantially parallel lines and a pair of opposed circular sections.

4,960,222

SECONDARY LIQUID CONTAINMENT SYSTEM

Grethel C. Fields, III, Jacksonville, Fla., assignor to Recontainer, Inc., Jacksonville, Fla.

Filed Jul. 31, 1989, Ser. No. 386,689
Int. Cl.[5] B65D *90/16, 90/24*
U.S. Cl. 220—5 A **17 Claims**



1. A secondary containment system for storing liquids which comprises a totally enclosed cylindrical primary storage tank for liquid inside and spaced apart from a cylindrical secondary storage tank for liquid having one circular head at a closed end and a second circular head spaced inwardly from an open end, said tanks having mutually parallel longitudinal horizontal axes; said secondary tank having two parallel elongated beam members fastened thereto on the outside of the secondary tank, generally parallel to said longitudinal axes and structurally adapted to be external supports for said secondary tank; two parallel elongated lengthwise internal skid members in said secondary tank to support said primary tank in spaced relationship to and within said secondary tank; said open end of said secondary tank comprising said second circular head positioned inwardly from said open end and spaced apart from said primary tank to leave a cylindrical open recess between said open end and said second circular head; horizontal flooring in said recess, a dispensing liquid pump on said flooring with a suction line from said pump to the inside of said primary tank; a first vent means from inside said primary tank to the atmosphere surrounding said secondary tank, a pressure relief means for said primary tank leading to the atmosphere surrounding said secondary tank; and a passageway from outside said secondary tank to inside said primary tank for filling said primary tank with liquid.

4,960,223

BOX CRATE CONTAINER

Pei-Lieh Chiang, and Ming-yao Chiang, both of Pei Tun Road, Taichung, Taiwan

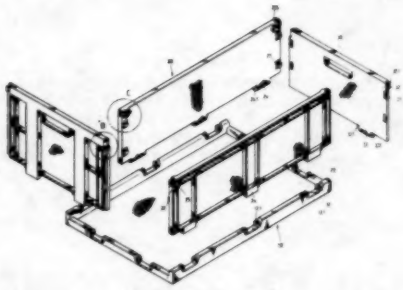
Filed Jul. 18, 1989, Ser. No. 381,210
Int. Cl.[5] B65D *88/52*
U.S. Cl. 220—7 **1 Claim**

1. An improved box crate container, comprising: a base plate, a pair of side plates and a pair of handle plates;

said base plate on which periphery is formed a plurality of swivel recesses, on either side of each said swivel recess is formed a pair of pivot tabs, a pivot hole which is formed on each said pivot tab;

each said side plate which has two "T" shaped slots formed respectively on the upper corners of the inner surface, each section of said "T" shaped slots that is parallel with the upper edge of said side plates is formed a guide, an "L" shaped release bar formed within each said "T" shaped slot and parallel to said guide, on the end of said release bar is formed an actuating end, a plurality of "L" shaped protruding catches formed on the inner peripheral surface under each said "T" shaped slot, a plurality of connecting blocks formed on the lower portion, each said connecting block which has a pair of snap-fitting pivot axes formed on either side; said side plates are connected with said base plate by pressing downward and passing said snap-fitting pivot axes through said pivot holes;

each said handle plate which has two hook shaped snap-fitting locking tabs formed respectively on the upper corners and connected with said "T" shaped slots of said side plates, a plurality of rectangular slots formed on the inner peripheral surface which is corresponding and adjacent to said "L" shaped protruding catches, a plurality of connecting blocks formed on the lower portion, each said connecting block which has a pair of snap-fitting pivot axes formed on either side; said handle plates are connected with said base plate by pressing downward and passing said snap-fitting pivot axes through said pivot holes; said rectangular slots of said handle plates are connected with said "L" shaped protruding catches of said side plates by pivoting upward; said container is collapsible when said actuating end of said release bar is pressed to bend said hook shaped snap-fitting locking tab one way to release the interlock of said side and handle plates.



4,960,224

CLOSURE AND CONTAINER FOR REGENT AND SLIDES

Thomas Boenisch, 5073 San Rodrigo Ave., Santa Barbara, Calif. 93111

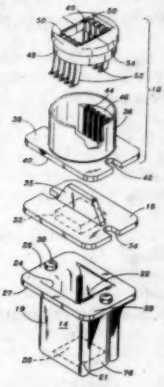
Filed Mar. 24, 1989, Ser. No. 328,538
Int. Cl.[5] B65D *85/48;* **B05C** *3/00*
U.S. Cl. 206—456 **9 Claims**

1. A cassette for tissue staining, said cassette comprising:

a. a container having an interior for tissue staining reagent and including an open mouth;

b. a slide retainer adapted to fit over the open mouth of said container for vertically suspending a plurality of specimen slides in said container interior, said slide retainer comprising a retainer body defining sidewalls and top and bottom ends, at least said bottom end being open for communication therethrough with said container interior, pairs of spacing means carried by opposing sidewalls of said retainer body for receiving the ends and upper edge portions of said specimen slides and for maintaining specimen containing surfaces of said specimen slides in spaced relationship with respect to adjacent surfaces, spring means associated with each of said pairs of spacing means, for acting against a surface of a slide and cooperating with

said associated spacing means for holding said slide end portions in said retainer body; and



c. means for supporting said retainer body over said open mouth of said container.

4,960,225

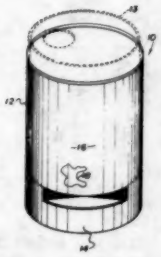
COVER STRUCTURE FOR BEVERAGE CANS OR LIKE CONTAINERS

Rolando Gillis, 12908 SW. 48th St., Miami, Fla. 33175

Filed Sep. 7, 1989, Ser. No. 403,874

Int. Cl.[5] B65D *90/12*

U.S. Cl. 220—85 H **11 Claims**



1. For use in combination with a beverage container having a bottom end and an exterior surface, a cover structure adapted to be removably mounted in covering relation to the exterior surface of the beverage container, said cover structure comprising:

a. a substantially elongate, cylindrical base formed of a substantially flexible material and including a cylindrical wall disposed in surrounding relation to a hollow interior, said cylindrical wall adapted to be folded longitudinally between a collapsed, substantially flat position and an open, cylindrical operable position,

b. an access opening formed on one end of said cylindrical base dimensioned and configured to allow sliding passage of the beverage container therethrough for nested engagement within said hollow interior,

c. support means disposed on an opposite end of said cylindrical base structured and configured to extend inwardly with said hollow interior in supporting relation to the bottom end of the beverage container, said support means including at least two support members having an elongate configuration and pivotally attached at opposite ends thereof to said cylindrical wall so as to be independently movable between a retracted position and a support position,

d. said cylindrical wall dimensioned and configured such that an interior surface of said cylindrical wall is disposed in substantially covering, surrounding and engaging relation to the exterior surface of the beverage container, and

e. said cylindrical wall including an outer surface adapted for application of decorative indicia thereon.

4,960,226

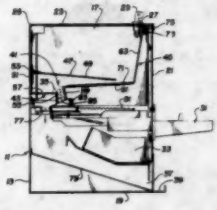
APPARATUS FOR DISPENSING PENCILS WITH ERASURE FERRULES HAVING A HOPPER WITH A COATING ON ITS SURFACE THAT PREVENTS THE FERRULES FROM CONTACTING THE HOPPER

Sylvester L. Ehrle, 1103 Eton, Richardson, Tex. 75080

Filed Jun. 6, 1989, Ser. No. 362,062

Int. Cl.[5] B65H *3/62*

U.S. Cl. 221—202 **5 Claims**



1. Apparatus for dispensing generally cylindrical and elongated pencils, each having an eraser ferrule attached at one end thereof, said apparatus comprising:

a housing having an outlet from which pencils may be dispensed;

a hopper within the housing for storing a quantity of pencils positioned substantially horizontally and parallel with each other;

a delivery reservoir located within the housing below the hopper capable of holding a selected number of pencils;

an activation mechanism for moving the delivery reservoir from a first position in which said selected number of pencils may fall from the hopper into the delivery reservoir and a second position in which the pencils in the delivery reservoir may fall from the delivery reservoir to said outlet;

an agitator positioned within said hopper and defining the floor thereof, said agitator including an upper surface inclined in a first direction and adapted to support pencils thereon so that such pencils may move down said inclined surface; and

a patina on the upper surface of the agitator of sufficient thickness and width to support pencils positioned thereon so that the ferrules on the ends of the pencils do not contact the inclined surface of said agitator and do not contact the patina.

4,960,227

BULK MATERIAL CONTAINER WITH A FLEXIBLE LINER

Clarence B. Coleman, Oakland, Calif., assignor to Fabricated Metals, Inc., San Leandro, Calif.

Filed Sep. 30, 1988, Ser. No. 251,326

Int. Cl.[5] B65D *35/22*

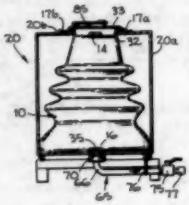
U.S. Cl. 222—94 **8 Claims**

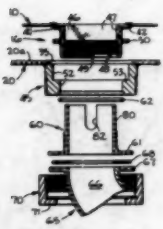
1. A bulk material container comprising:

(a) a shell having an opening at the bottom thereof;

(b) a discharge fitting secured to said shell below the opening thereof;

(c) a flexible liner disposed in said shell for containing bulk material, said flexible liner comprising a bottom outlet fitting disposable in said discharge fitting, said bottom outlet fitting including a threaded section; and





(d) a threaded sleeve disposed in threaded engagement with the threaded section of said bottom outlet fitting,

(e) said bottom outlet fitting including upright, flat, inner joining walls between axially aligned annular flanges adapted to be gripped by a tool.

4,960,228

PORTABLE POST-MIX BEVERAGE DISPENSER UNIT

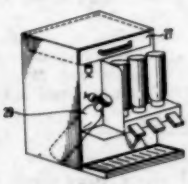
Yutaka Takahashi, Fujisawa; Ikuo Harashima, Maebashi; Sunichi Nakayama, Takasaki; Yasuyuki Arai, Isesaki; Yasushi Takayanagi, Sawa; Ryoichi Sekiguchi, Isesaki; Tomomitsu Abe, Hadano, and Hiroshi Hayakawa, Yokohama, all of Japan, assignors to Sanden Corporation, Guma and Kirin Brewery Co., Ltd., Tokyo, both of, Japan

Filed Dec. 8, 1988, Ser. No. 281,070

Claims priority, application Japan, Dec. 8, 1987, 62-308735

Int. Cl.[5] B67D *5/06, 5/56, 5/62*

U.S. Cl. 222—129.1 **9 Claims**



1. A post-mix beverage dispensing system comprising:

a cabinet housing having an openable top access panel, an openable front access panel defining a region in which a plurality of syrup packages are accommodated side by side, and an additional panel disposed adjacent said front access panel, said additional panel being forwardly openable;

a detachable portable tank means for storing potable water, said portable tank means disposed behind said additional panel and removable from said housing by sliding forwardly therefrom when said additional panel is opened;

cooling reservoir means for cooling potable water supplied from said portable tank means, said cooling reservoir disposed within said cabinet at a position behind said syrup packages;

carbonator means disposed in said cooling reservoir for producing carbonated water by mixing cooled water from said portable tank means with CO_2;

CO_2 tank means for supplying CO_2 to said carbonator means, said CO_2 tank means vertically disposed between said portable tank means and said cooling reservoir means;

first pipe means partially disposed in said cooling reservoir means for linking said portable tank means to said carbonator means;

second pipe means for linking said CO_2 tank means with said carbonator means;

valve means for controlling the flow of carbonated water from said carbonator means; and

third pipe means linking said carbonator means with said valve means.

4,960,229

VIBRATORY TYPE STORAGE BIN ARRANGEMENT WITH INTERNAL BAFFLING AND LOW PROFILE BOTTOM

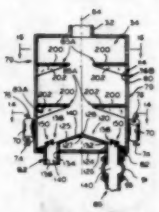
George D. Dumbaugh, Louisville, Ky., assignor to Kinergy Corporation, Louisville, Ky.

Continuation-in-part of Ser. No. 131,942, Dec. 11, 1987, Pat. No. 4,844,289. This application May 4, 1989, Ser. No. 347,240

The portion of the term of this patent subsequent to Jul. 4, 2006, has been disclaimed.

Int. Cl.[5] B65G *27/00, 3/12*

U.S. Cl. 222—161 **5 Claims**



1. A bin for receiving, storing and discharging bulk solid materials of the types that are responsive to a vibratory conveying action, said bin comprising:

a vessel for storing a quantity of bulk solid materials in vertical columnar form, and defining a cylindrical side wall having upper and lower ends and that is symmetrical about a vertical axis at the center of said vessel,

said vessel having internally thereof, between said upper and lower ends thereof, a plurality of vertically spaced baffle levels,

said baffle levels each comprising a set of a plurality of horizontal imperforate baffle plates each cantilever mounted on said vessel side wall in substantial coplanar relation, with said plates of each of said sets extending short of said axis, and said plates at each said sets being spaced for facilitating down feed of the bulk solid material through said baffle levels,

said imperforate plate sets each being essentially centered on said axis,

said vessel having an upper inlet port above said baffle levels for accepting the bulk solid material into said vessel,

with said vessel having a low profile bottom section below said baffle levels defining a bulk solid materials conveying surface and at least one discharge port arrangement dis-

posed to one side of said axis and defining a vertically rectilinear discharge chute having a vertical central axis, and means for imparting a helical type vibratory stroke action about said axis to the bulk solid material contained within said vessel for effecting movement of the bulk solid material received in said vessel both downwardly thereof induced vertical flow fashion, and conveying the bulk material impelled retrieving conveying fashion over said bottom conveying surface, and into said discharge port, for gravity discharge from said bin.

4,960,230

DELIVERY PUMP FOR FLUID CONTAINERS

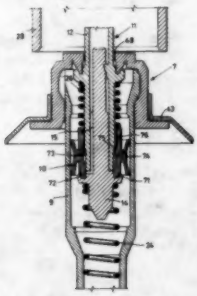
Luciano Marelli, Rozzano, Italy, assignor to Elettro Plastica S.R.L., Milan, Italy

Filed Jan. 17, 1989, Ser. No. 297,125

Claims priority, application Italy, Jul. 30, 1987, 22133/87[U]

Int. Cl.[5] G01F *11/02*

U.S. Cl. 222—321 **7 Claims**



1. Delivery pump for a fluid container, comprising a pump chamber, a flexible ring piston sealingly axially movable in said chamber intermediate the ends thereof operatively to define therein a lower cavity for containing the fluid to be delivered and an upper cavity for containing air at atmospheric pressure, a stem valve coaxially movably arranged in said chamber and passing slidably through said piston to cooperate therewith selectively to open and close communication of said lower cavity with the outside of said container, first spring means arranged in said lower cavity for resiliently urging the stem valve to a rest position, second spring means arranged in said upper cavity and reacting against a projection formed on said stem valve adjacent the upper end thereof for resiliently urging said piston towards a lower, enlarged end of said stem valve to close said communication, said valve having a tapered groove formed in said enlarged end thereof to receive frictionally a corresponding tapered lower end portion of the piston when in closed position, said stem valve having thereon a body portion located between said projection and said enlarged end thereof and which includes an upper portion of major diameter and a lower portion of minor diameter, and said piston having an internal ring-shaped protuberance which cooperates with said valve body portion to engage said lower portion thereof at rest and said upper portion upon the opening movement of the valve.

4,960,231

FISH STRINGING SYSTEM

Eric S. Popovich, 1516 Viscaya Dr., Port Charlotte, Fla. 33952

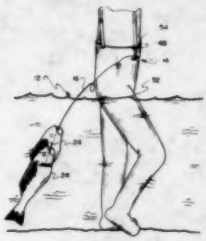
Filed Jun. 6, 1989, Ser. No. 362,254

Int. Cl.[5] A01K *65/00*

U.S. Cl. 224—103 **6 Claims**

1. A fish stringing system attachable to a fisherman for retaining caught fish comprising in combination:

a fish stringing assembly including a length of flexible line, the line having a first loop on a first end and a second loop on a second end remote from the first end, a fish stringing bar comprising a plate having a pointed end adapted for piercing the caught fish and threading the fish along the line, the fish stringing bar having a single centrally located aperture through said plate receiving the first loop of the line for allowing radial pivotal rotation of the fish stringing bar about the aperture when piercing the caught fish and when initially threading the fish along the line, and a fish retention bar for retaining the first threaded fish against the retention bar and serially storing each subsequently caught fish on the line while in contiguous contact



with the previously caught and threaded fish, the retention bar having a pair of longitudinally aligned apertures adapted for receiving the second loop of the line in a perpendicular relationship to preclude movement of the threaded and caught fish off of the line; and

an attachment assembly including a rigid attachment ring and a cord having a first end for coupling to the fisherman or the like and a second end remote therefrom for coupling to the attachment ring, the attachment ring having a fixed passage diameter sufficient for allowing unencumbered passage of the stringer bar and the length of line while the stringer bar is pivotally disposed in a parallel relationship to the length of line.

4,960,232

ARM BAND

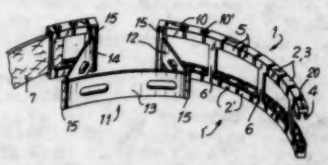
Gerhard Kienhöfer, Birkenfeld, Fed. Rep. of Germany, assignor to Firma Gerhard D. Wempe KG, Hamburg, Fed. Rep. of Germany

Filed Nov. 28, 1988, Ser. No. 277,001

Claims priority, application Fed. Rep. of Germany, Apr. 25, 1988, 8805454[U]

Int. Cl.[5] A44C *5/12*

U.S. Cl. 224—179 **18 Claims**



1. An arm band, particularly a watch arm band, comprising a holder provided on its front side and a holder on its rear side, said holders having a U-shaped cross-section; a plurality of webs connecting said holders with one another; a band exchangeably accommodated between said holders and arranged so that end portions of said band extend in said U-shaped holders and a lower side of said band abuts against said webs, each of said holders being subdivided into a plurality of links

which are pivotally connected with one another, each of said links having a U-shaped cross-section having two legs and a central web connecting said legs with one another; and means for pivotally connecting at least some of said links with one another, said connecting means including a plurality of bars each having two ends and each pivotally connecting said central webs of two of said links, each of said bars having two ends each pivotally connected to a respective one of said two links by a rivet extending perpendicular to planes of said bars and said central webs of said links.

4,960,233

CARRYING BAG ASSEMBLY

Harry S. Morchower, Dallas, Tex., assignor to Dallas Handbag Company, Dallas, Tex.

Filed Dec. 6, 1989, Ser. No. 447,007

Int. Cl.[5] A45F *3/14*

U.S. Cl. 224—250 **6 Claims**

6. A carrying bag assembly, comprising:

a carrying bag for holding personal items;

a telephone receiver/transmitter unit attached to the carrying bag;

a wire and a plug on one end of the wire for connecting the receiver/transmitter unit to a telephone line;

a telephone handset;

a cord for attaching the handset to the receiver/transmitter unit;

a handle attached to the carrying bag;

two pieces of material, connected to the handle, for attaching the handset to the handle of the carrying bag, wherein the two pieces of material wrap around the handset and attach to one another; and

a keypad located on the outer surface of the carrying bag for dialing the telephone.

4,960,234

APPARATUS FOR SEPARATING WEBS OF MATERIAL INTO (TWO) PART WEBS

Heinz Focke, Verden, Fed. Rep. of Germany, assignor to Focke & Co. (GmbH & Co.), Verden, Fed. Rep. of Germany

Filed Sep. 30, 1988, Ser. No. 252,083

Claims priority, application Fed. Rep. of Germany, Oct. 1, 1987, 3733129

Int. Cl.[5] B65H *23/26*; B23Q *15/22*

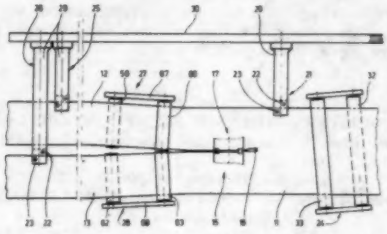
U.S. Cl. 226—15 **10 Claims**

1. Apparatus for continuously separating a conveyed web of material into at least two part webs, in conjunction with a packaging machine, comprising:

three web-adjusting member means (**24, 27, 28**) comprising three pairs of deflecting rollers (**32, 33; 59, 60; 62, 63**), respectively; the deflecting rollers of each pair being spaced from one another and being rotatably mounted on one of three adjustably pivotable common roller-carriers (**34, 61, 64**), one roller-carrier being for guiding the web (**11**), and two roller-carriers being for guiding said part webs (**12, 13**), respectively;

web-monitoring members for controlling the positions of the three roller-carriers (**34, 61, 64**);

wherein the two pairs of deflecting rollers (**59** and **60** or **62** and **63**) mounted respectively on said two roller-carriers (**61, 64**) are mounted in such a relative position in relation to one another that the two leading deflecting rollers (**60** and **63**) of said two pairs of deflecting rollers are arranged at a short distance from one another, while the trailing deflecting rollers (**59, 62**) of said two pairs of deflecting



rollers are arranged at a longer distance from one another; and

wherein said two roller-carriers (**61, 64**) are arranged on a common supporting frame (**69**) and are respectively adjustable by means of separate regulating gears in the form of servo-motors (**80, 81**) and spindle rods (**82, 83**).

4,960,235

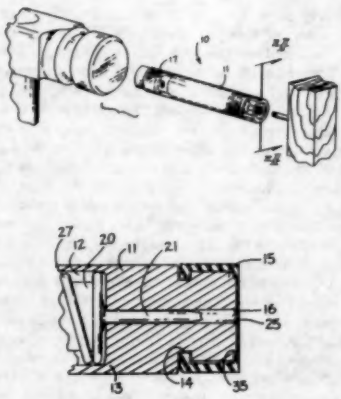
NAIL SET DEVICE

Glenn R. Gregory, 557 Moosetrot Ave., Fairbanks, Ak. 99712

Filed Nov. 20, 1989, Ser. No. 439,157

Int. Cl.[5] B25C *3/00*

U.S. Cl. 227—147 **1 Claim**



1. A nail set device comprising in combination,

an elongate cylindrical housing including a first cylindrical bore extending interiorly and axially of said housing and terminating in a forward planar wall with a second cylindrical bore extending from said forward planar wall through to a further end of said housing axially aligned with said first cylindrical bore, and

a punch of a length greater than that of said first bore axially receivable and slidable within said first cylindrical bore and including a forward conical nose and of complementary configuration to said planar wall with a plunger extending axially and forwardly of said conical nose and

receivable within said second cylindrical bore and of a length greater than that of said cylindrical bore, and

shock impact means secured to said housing and extending forwardly of said further end for receiving impact of said housing upon a work surface, and

wherein said punch includes a first reduced diameter portion spaced from a free end of said punch extending rearwardly of said housing wherein said first reduced diameter portion is of a diameter less than that of said first cylindrical bore and receives an adjustment screw therewithin wherein said adjustment screw is threadedly received within said housing to limit reciprocation of said punch within said housing, and

wherein a return spring is captured between said planar wall and a main body of said punch to maintain said punch in a retracted position, and

wherein said shock impact means includes a polymeric bumper, said polymeric bumper including a first circular flange, said first directed flange receivable within a first circular groove formed within said cylindrical housing spaced from said forward end and said bumper including a second inwardly directed flange receivable within a second circular "L" shaped groove formed within adjacent terminal end of said further end, and said second "L" shaped groove defined by a predetermined height less than that defined by a predetermined thickness of said second flange to project said second flange forwardly of said further end, and the cylindrical housing formed rearwardly of said groove and said further end is of a further diameter less than that of an external diameter by said housing, and said polymeric bumper defining a cylindrical body between the first and second circular flanges to permit removal and reversal of the bumper relative to the first and second "L" shaped grooves, said bumper is of a thickness substantially equal to the difference between the external diameter of the housing and the further diameter of said further end.

4,960,236

MANUFACTURE OF PRINTED CIRCUIT BOARD ASSEMBLIES

Philip S. Hedges, Luton, and Wallace Rubin, Northwood, both of Great Britain, assignors to Multicore Solders Limited, Hemel Hempstead, Great Britain

Filed Aug. 14, 1989, Ser. No. 393,590
Int. Cl.[5] B23K *1/02*; H05K *3/34*
U.S. Cl. 228—180.1 **20 Claims**

1. In the manufacture of printed circuit board assemblies by a process including the steps of applying a solder cream to a printed circuit board in required locations thereon, mounting on the board the desired electronic components, and thereafter to subjecting the resulting printed circuit board assembly to an elevated temperature sufficient to cause solder reflow, the improvement which comprises utilising as the solder cream a screen-printable paste composition comprising from 80 to 95% by weight of a finely divided soft solder alloy having a particle size of up to 100 μm substantially uniformly dispersed in a liquid medium containing not more than 10% by weight of a non-corrosive organic flux material selected from organic carboxylic acids, amines and amine hydrohalide salts, a substantially water-immiscible organic solvent and one or more thickening agents, and thereby obviating the necessity of subjecting the soldered pcb assembly to a cleaning step after the solder reflow step.

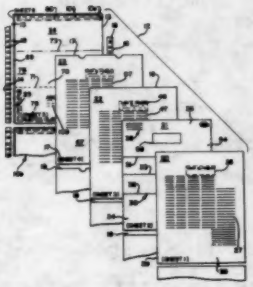
4,960,237

SELF-CONTAINED INSERT MAILER

Bruce Bendel, 1545 White Oak Rd., Lake Forest, Ill. 60045

Filed Aug. 9, 1988, Ser. No. 229,989
Int. Cl.[5] B65D *27/06, 27/10, 27/34*
U.S. Cl. 229—73 **34 Claims**

1. A self-contained insert mailer for mailing an insert, comprising a plurality of individual, separate plies adjacently disposed in overlying relationship, each of said individual plies being of substantially the same size, the mailer including a front ply, a back ply and at least one insert ply disposed therebetween, said front ply including at least one fold line, said front ply defining a mailer outgoing envelope when said mailer is folded upon itself along said front ply fold line, adhesive means disposed along a face of said back ply for adhesively securing a portion of said back ply to a portion of said front ply after folding said mailer along said front ply fold line to form the mailer outgoing envelope and for maintaining said outgoing



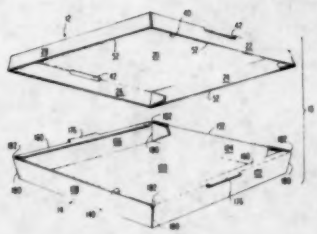
envelope in said folded condition, said back ply including a return envelope portion for forming a return envelope, said back ply further including a discard portion separated from the return envelope portion by a line of weakening, said return envelope portion having a return envelope fold line disposed generally parallel to said front ply fold line, the return envelope fold line separating said return envelope portion into a return envelope face portion and a return envelope flap portion, said mailer outgoing envelope having a predetermined height to length ratio conforming to postal height to length ratio standards.

4,960,238

2-PIECE PIZZA BOX WITH CUT-OUT CORNERS

Achim R. Lorenz, Marietta, Ga., assignor to MacMillan Bloedel Containers, Atlanta, Ga.

Filed Apr. 18, 1989, Ser. No. 339,798
Int. Cl.[5] B65D *5/20*
U.S. Cl. 229—125.29 **16 Claims**



1. A blank for a tray piece in a two-piece container comprising a cover and a tray, said blank comprising:

a first wall section, and

sidewall sections connected to said first wall section, said sidewall sections being upwardly foldable with respect to said first wall to taper outwardly therefrom, said sidewall sections having generally trapezoidal central portions, two opposing sidewall sections each having flap sections connected along a fold lines on the longitudinal end portion thereof, said flap sections each having an edge form-

ing a cut-out section above said fold line with an edge of its respective sidewall, two other opposing sidewall sections having edges located to come into alignment with said edges of said flap sections to form cut-out sections for the corners of said tray when all said sidewall sections are folded upwardly to form said tray.

4,960,239

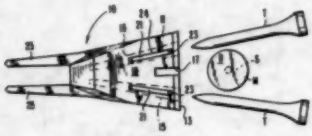
GOLF TOOL AND CARRIER FOR GOLF ITEMS

David S. Wait, 226 E. John St., Forrest, Ill. 61741

Filed Feb. 26, 1990, Ser. No. 485,220

Int. Cl.[5] A63B *57/00*

U.S. Cl. 273—32 B **10 Claims**



1. A golf device comprising:

a one-piece body having a top face, a bottom face and an end face;

a turf repair tool including a pair of prongs extending from said body opposite said end face;

said body defining a number of elongated cavities extending from said end face into said one-piece body, each of said number of cavities being sized to snugly receive a golf tee therein;

said body further defining a slot having an opening at said top face and at said end face for slidably receiving the stem of a ball marker therein;

retaining means for retaining the disk of the ball marker at said top face when the stem is within said slot, said retaining means being resiliently displaceable to permit insertion and removal of the ball marker disk from the golf device; and

a belt clip disposed on said one-piece body at said bottom face.

4,960,240

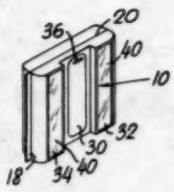
AIR FRESHENER WITH INTEGRAL TEAR-AWAY TAB

Mark W. McElfresh, Burlington, Ky., assignor to The Drackett Company, Cincinnati, Ohio

Filed Apr. 24, 1989, Ser. No. 341,882

Int. Cl.[5] A61L *9/12*

U.S. Cl. 239—56 **4 Claims**



1. An air freshener dispenser comprising:

a unitary container comprising a first partial enclosure and a second partial enclosure, said first and second partial enclosures joined along a hinge integrally formed therebetween, said first and second partial enclosures adapted to be folded about said hinge and sealed together to form a hermetically sealed enclosure;

at least one of said first or second partial enclosures further comprising:

a tear-away tab integrally formed therein, said tear-away tab having, and being defined by, a perimeter thinned a sufficient amount to maintain said enclosure hermetically sealed, so long as said tab remains in place, said tab provided with an integral grasping means to enable a user to remove said tear-away tab from its associated partial enclosure to thereby form an aperture therein and expose the interior of said hermetically sealed enclosure;

a member retaining a vaporizable substance to be dispensed into the ambient air, said member adapted to be retained within said hermetically sealed enclosure and exposed through said aperture after said tab is removed; and

means integrally formed with one of said first or second partial enclosures for maintaining said aperture in spaced relation to a mounting surface.

4,960,241

DIESEL ENGINE PUMP NOZZLE HAVING A CONTROL SLEEVE

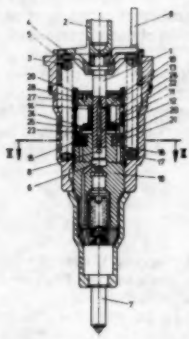
Maximilian Kronberger, and Eugen Drummer, both of Steyr, Austria, assignors to Voest-Alpine Automotive Gesellschaft m.b.H., Linz, Austria

Filed Apr. 4, 1989, Ser. No. 332,722

Claims priority, application Fed. Rep. of Germany, Apr. 8, 1988, 3811846

Int. Cl.[5] F02M *47/02*; F04B *39/10*

U.S. Cl. 239—90 **16 Claims**



1. A diesel engine pump nozzle, comprising:

a housing having an inlet for fuel, and a normally closed, intermittently openable valved injunction nozzle for delivering fuel to a cylinder of a diesel engine;

a pump element body received in the housing between the fuel inlet and the valved injection nozzle, said pump element body having a longitudinal axis;

means defining a pump piston chamber extending coaxially in said pump element body from an outer end of said pump element body;

said pump piston chamber having a suction bore communicated with said fuel inlet and a fuel delivery passageway communicated with said valved injection nozzle;

a pump piston longitudinally slidingly received in said pump piston chamber and having a protruding outer end arranged to be intermittently pushed axially inwards by a diesel engine cam shaft sufficiently for causing fuel which has been drawn into said pump piston chamber through said suction bore, to be forced out of said pump piston chamber through said fuel delivery passageway for being injected into a diesel engine cylinder through said valved injection nozzle;

spring means provided between the pump piston and the housing for returning said pump piston axially outwardly each time after said pump piston has been pushed axially inwards;

a control sleeve disposed in said pump element body in circumferentially surrounding relation to said pump piston;

means for axially adjusting positioning of said control sleeve relative to said pump element body in dependence on at least one diesel engine operating parameter for varying when, in a given cycle of fuel injection, injection of fuel begins through said valved injection nozzle in relation to the extent to which said pump piston has been pushed downwards by a diesel engine cam shaft;

said pump piston being rotatable about said longitudinal axis, relative to said control sleeve, for adjusting how much fuel, in a given cycle, is injected through said valved injection nozzle;

means provided between said control sleeve and said pump element body for preventing rotation of said control sleeve relative to said pump element body;

a regulating member received within said housing and supported on said pump element body for angular rotation about said longitudinal axis, relative to said control sleeve;

means preventing substantial axial movement of said regulating member relative to said pump element body;

adjustable spring means acting between said control sleeve and said regulating member angularly of said longitudinal axis and tending to maintain said regulating member in, and restore said regulating member to a given angular position relative to said control sleeve, about said longitudinal axis;

one of said control sleeve and said regulating member being provided with at least one race which is approximately circularly arcuate in transverse cross-sectional shape and centered on said longitudinal axis, said race having throughout at least a segment of the length thereof a pitch angle relative to a normal plane which extends normal to said longitudinal axis; and

the other of said control sleeve and regulating member having a guide element which engagingly cooperates with said race, so that as the regulating member and control sleeve are relatively rotated about said longitudinal axis, the control sleeve is axially moved relative to the pump piston; and

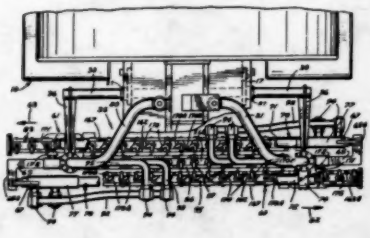
means for adjustably forcibly rotating said regulating member and control sleeve against restoration force provided by said adjustable torsion spring means.

4,960,242

ASPHALT DISTRIBUTOR

David L. Larson, Plymouth, Minn., assignor to Rosco Manufacturing Company, Madison, S. Dak.

Filed Jul. 28, 1988, Ser. No. 225,712
Int. Cl.[5] E01C *19/17*
U.S. Cl. 239—168 **18 Claims**



1. Apparatus adapted for spraying materials from a moving vehicle comprising:

a frame having means for mounting it onto a vehicle, said frame being positioned to extend generally transverse to the direction of travel of a vehicle mounting the apparatus;

at least one movable spray bar assembly mounted on said frame comprising a manifold tube having a longitudinal axis extending generally transverse to the direction of travel of such vehicle, said manifold tube having a plurality of nozzles therein for carrying material to be sprayed from the manifold tube out through the nozzles;

a fluid pressure actuator for mounting and moving said movable spray bar in longitudinal direction of the manifold tube, said fluid pressure actuator having a cylinder member and an extendable and retractable rod member mounted relative to the cylinder member;

means to fixedly mount said cylinder member to said frame at a desired location;

means to slidably support a first end of said movable spray bar assembly on the exterior of the cylinder member for movement in direction along the cylinder member relative to the frame; and

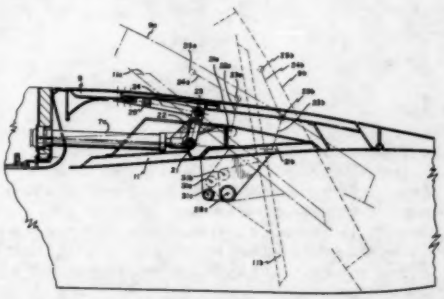
means to couple a second end of the manifold tube to the rod member of the fluid pressure actuator whereby operation of the fluid pressure actuator will cause the manifold tube to be extended or retracted in direction along its longitudinal axis while substantially supported only by the fluid pressure actuator.

4,960,243

THRUST REVERSER FOR A TURBOJET ENGINE

Claude A. G. Dubois, Honfleur, and Xavier R. Y. Lore, Le Havre, both of France, assignors to Societe Anonyme Dite Hispano-Suiza, France

Filed Oct. 19, 1989, Ser. No. 424,333
Claims priority, application France, Oct. 20, 1988, 88 13766
Int. Cl.[5] F02K *1/64*
U.S. Cl. 239—265.29 **22 Claims**



1. A thrust reverser for a turbojet engine having an annular housing extending along a longitudinal axis and having an outer housing surface, an inner housing surface defining an airflow duct and at least one laterally facing opening, comprising:

(a) at least one thrust reverser door having an outer door panel and an inner door panel located radially inwardly from the outer door panel, movable between a closed position wherein the door covers the at least one laterally facing opening such that the inner door panel is substantially flush with the inner housing surface and the outer door panel is substantially flush with the outer housing surface, and an open position wherein the at least one laterally facing opening is uncovered;

(b) first attaching means to pivotally attach the inner door panel to the annular housing such that the inner door panel pivots about a first pivot axis extending generally transverse to the longitudinal axis;

(c) second attaching means to pivotally attach the outer door panel to the inner door panel such that it may pivot about a second pivot axis extending generally parallel to, but displaced from, the first pivot axis;

(d) actuating means connected between the annular housing

and the inner door panel to move the at least one thrust reverser door between its open and closed positions; and,

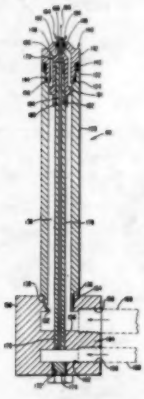
(e) linkage means interconnecting the inner and outer door panels such that the inner door panel pivots through a greater angle than the outer door panel as the at least one thrust reverser door moves between its open and closed positions.

4,960,244

ATOMIZING NOZZLE ASSEMBLY

Gustav A. Maag, Miami Beach, and John N. Wells, Cooper City, both of Fla., assignors to Schering Corporation, Kenilworth, N.J.

Filed May 8, 1989, Ser. No. 348,743
Int. Cl.[5] B05B *7/06*
U.S. Cl. 239—424 21 Claims



1. An atomizing nozzle comprising:

(a) elongated hollow tube defining a chamber therein, said tube including opposite atomizing and supply ends, both in fluid communication with said chamber;

(b) a supply housing connected at the supply end of said tube, said supply housing including:

(i) an air supply port in fluid communication with said chamber,

(ii) a liquid supply port in fluid communication with said chamber, said liquid supply port being separated from said air supply port; and

(iii) a passageway interconnecting said air and liquid supply ports;

(c) flow constriction means for supplying said liquid from said liquid supply port to said atomizing end with a controlled flow constriction, said flow constriction means including flow control tube means, extending within said hollow tube between said liquid supply port and said atomizing end, for supplying said liquid to be atomized to said atomizing end, said flow control tube means having an inner bore providing said flow constriction to said liquid travelling from said liquid supply port to said atomizing end, said flow control tube means including a supply end and an atomizing end, said supply end removably extending within said passageway in a fluid sealing manner so as to fluidly separate said air supply port and said liquid supply port;

(d) an air cap removably secured to the atomizing end of said elongated hollow tube and having a central atomizing opening;

(e) said flow control tube means being dimensioned to permit removal and replacement of said flow control tube means through said atomizing end of said hollow tube when said air cap is removed therefrom; and

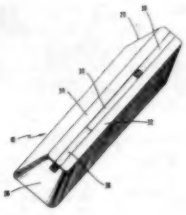
(f) wherein said liquid is supplied from said flow control tube means through the atomizing end thereof, and air is supplied from said chamber through an annular gap defined between said flow control tube means and said air cap for atomizing the liquid exiting from said flow control tube means.

4,960,245

CASTING NOZZLE WITH DISCHARGE SLOT DEFINED BY REFRACTORY INSERTS

Naim S. Hemmat, Mendham, N.J., assignor to Electric Power Research Institute, Palo Alto, Calif.

Continuation of Ser. No. 458,765, Jan. 17, 1983, Pat. No. 4,843,692. This application May 3, 1989, Ser. No. 346,953
Int. Cl.[5] B05B *1/00;* B22D *41/08*
U.S. Cl. 239—597 4 Claims



1. A nozzle for controllably casting a continuous metal strip, comprising:

(a) a nozzle body, said nozzle body having an inlet for receiving molten metal from a reservoir;

(b) a continuous, elongated slot extending transversely across substantially the entire length of the nozzle body in fluid communication with said inlet defining a discharge path for molten metal received by said nozzle body, said slot separating a pair of spaced cooperating lips for directing molten metal onto a casting surface; and

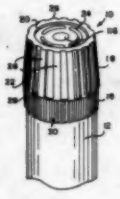
(c) castable refractory inset material, compatible with said nozzle, cast in place in a portion of said slot between the lips so as to be securely held in position for limiting the transverse dimension of the discharge slot and minimizing cracking.

4,960,246

GRINDER CLOSURE FOR A CONTAINER

Scott R. Fohrman, 1123 Linden, Wilmette, Ill. 60091

Filed Oct. 19, 1989, Ser. No. 423,962
Int. Cl.[5] A47J *42/04*
U.S. Cl. 241—169.1 22 Claims



1. A grinder closure for a container, comprising:

a base with an open lower end and a vertically projecting tubular barrel portion having an open upper end, and

interior and exterior surfaces, said base being configured for attachment to the container;

an outer grinding member having an annular grinding surface and configured to be secured against axial rotation within said barrel portion;

an inner grinding member provided with a grinding surface and configured to rotate axially within an area defined by said annular grinding surface;

an outer tubular shell having an open lower end and an upper end with at least one opening, said shell being configured to be journalled about said barrel portion;

keeper means for securing said inner grinding member to said shell; and

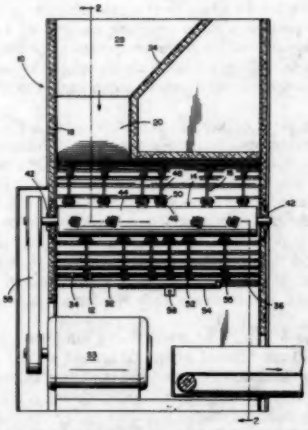
retaining means for securing said shell to said base so that said shell may rotate axially relative to said base.

4,960,247

COMPOST SHREDDER

Vernon J. Lundell, Box 171, Cherokee, Iowa 51012

Filed Apr. 11, 1989, Ser. No. 336,434
Int. Cl.[5] B02C *13/04*
U.S. Cl. 241—188 R **14 Claims**



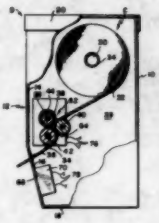
1. A compost shredder comprising an elongated cylinder, means supporting the cylinder in substantially horizontal position, an inlet at the top and adjacent one end of the cylinder, an outlet adjacent the bottom at the opposite end of the cylinder, a rotatable member mounted for rotation within the cylinder with the axis of rotation of the rotatable member being coincidental to the central axis of the cylinder, means driving said rotatable member, a plurality of hammer members extending radially from the rotatable member toward the interior of the cylinder, means pivotally mounting the inner ends of the hammer members to the rotatable member for pivotal movement about axes parallel to the rotational axis of the rotatable member, said cylinder including a plurality of circumferentially spaced, longitudinally extending grate bars fixedly mounted on the inner surface thereof, the outer ends of the hammer members being disposed closely adjacent the grate bars to shred material placed in the cylinder, said hammer members having an angulated portion inclined in relation to the axis of rotation of the rotatable member to move material being shredded in a spiral path from the end of the cylinder having the inlet toward the end of the cylinder having the outlet.

4,960,248

APPARATUS AND METHOD FOR DISPENSING TOWELING

Albert H. Bauer, Orlando, and Daniel C. Shaw, Geneva, both of Fla., assignors to Bauer Industries, Inc., Orlando, Fla.

Filed Mar. 16, 1989, Ser. No. 324,092
Int. Cl.[5] B65H *16/02, 16/06*
U.S. Cl. 242—55.53 **24 Claims**



1. A dispenser for roll toweling and the like, comprising:

(a) a housing having an aperture;

(b) means with said housing for rotatably mounting a roll of toweling.

(c) means within said housing for causing the roll to rotate so that toweling is dispensed through said aperture;

(d) passive non-emitting sense means operably associated with said causing means for monitoring a pre-selected portion of the infrared spectrum associated with animate bodies so that the presence of an animate body may be detected and for causing selective operation of said causing means upon an animate body being detected; and

(e) said passive sense means including a timing circuit means operably connected to said causing means for preventing operation of said causing means unless the pre-selected portion of the infrared spectrum is present for a sufficient period.

4,960,249

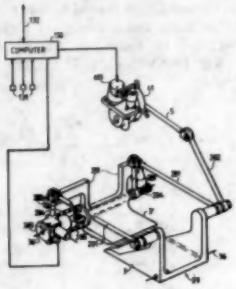
CONTROLLED VALVE WITH POSSIBILITY OF AUTONOMCUS OPENING AND AIRCRAFT WITH A VALVE OF THIS TYPE

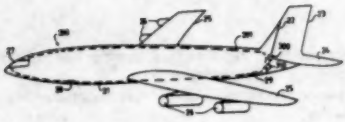
Jacques Signoret, Toulouse; Jacques Fraisse, Auzielle; Bruno Baroux, Toulouse, and Francis Carla, St. Orens de Gameville, all of France, assignors to Abg Semca, Toulouse, France

Filed May 24, 1989, Ser. No. 356,212
Claims priority, application France, May 27, 1988, 88 07082
Int. Cl.[5] B64D *13/00*
U.S. Cl. 244—118.5 **11 Claims**

1. A thrust recovery valve with two flaps having positioning means that enable it to be opened upon command, wherein at

least one of the flaps can rotate on its rotational axis and get detached from the positioning means to open if the pressure





difference on the two faces of the flap exceeds a predetermined threshold.

4,960,250

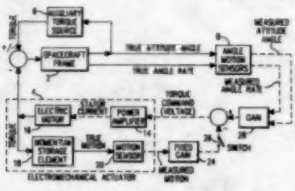
ENERGY DESATURATION OF ELECTROMECHANICAL ACTUATORS USED IN SATELLITE ATTITUDE CONTROL

Donald J. Schmidt, Ellicott City, Md., assignor to Space Industries Partnership, L.P., Webster, Tex.

Filed Sep. 12, 1988, Ser. No. 242,984

Int. Cl.[5] B64G *1/24*

U.S. Cl. 244—164 **15 Claims**



1. In an attitude control system for a spacecraft having a frame which is to be maintained in a desired orientation relative to a selected set of reference axes, which system includes an electromechanical actuator mechanically coupled to the spacecraft frame for applying to the frame a mechanical torque which opposes deviations from the desired orientation relative to at least one reference coordinate, the actuator including an electric motor and an element connected to be rotated by the motor, and torque command signal generating means connected to the motor for applying a torque command signal which is a function of such deviations and which drives the motor in a manner to control the torque being produced by the actuator, the improvement comprising energy desaturating means comprising: means coupled to said element for producing a signal representative of element motion; signal modifying means connected to produce a control signal having a magnitude which is a function of the signal representative of element motion, said signal modifying means comprising a signal amplifying device having a fixed gain; and signal coupling means including a switch connected for applying the control signal to said actuator with a polarity for effecting actuator desaturation only during the times that said switch is closed.

4,960,251

DETERMINING A REFERENCE IN A METHOD OF DETECTING OVERHEATING OF BEARINGS

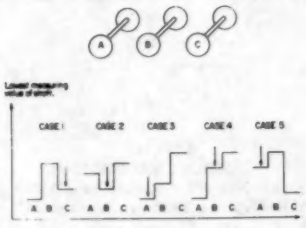
Sigurd Nyman, Akersberga, Sweden, assignor to Frontec Produkter Aktiebolag, Sollentuna, Sweden

Continuation-in-part of Ser. No. 142,735, Jan. 11, 1988, abandoned. This application Jul. 21, 1989, Ser. No. 383,904

Claims priority, application Sweden, Jan. 16, 1987, 8700164

Int. Cl.[5] B61L *3/00*

U.S. Cl. 246—169 A **3 Claims**



1. A method for detecting over heated bearings in a vehicle sequentially passing a fixed detector capable of providing successive signals related to the temperature of the bearings associated with each of successively moving axles associated with such bearings, said method comprising the following steps:

comparing at least three such signals A, B and C, which signals correspond to the temperatures of three axle bearings to determine if a condition I exists, said condition I being if B is less and A, and if B is less than C, and choosing B if condition I exists, subjecting said signals A, B and C to a further comparison step if said condition I is not present to determine if a condition II exits, said condition II being if A is less than B, and if C is less than, and if A is greater than C choosing A if said condition II exits, choosing C if C is greater than A establishing a condition III,

subjecting said signals A, B and C to a still further comparison if said conditions I, II and III are not present to determine if a condition IV exits, said condition IV being if A minus B is less than B minus C and choosing A if condition IV exits, and

comparing the signal so chosen A, B or C to the signals not chosen.

4,960,252

HOLDER FOR FASTENING AT LEAST ONE LONG ROUND BODY

Harmut Binder, Leonberg, Fed. Rep. of Germany, assignor to Dr. Ing. h.c.F. Porsche AG, Fed. Rep. of Germany

Filed Jun. 30, 1989, Ser. No. 373,443

Claims priority, application Fed. Rep. of Germany, Jul. 1, 1988, 3822374

Int. Cl.[5] F16L *5/00*; H02G *3/22*

U.S. Cl. 248—56 **7 Claims**

1. An arrangement for holding at least one long round body, comprising:

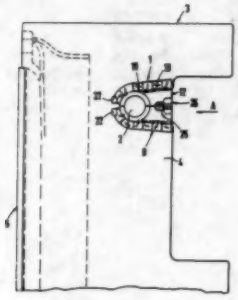
a stationary supporting part having a wall with a slotted opening for longitudinally slidably receiving a holder, the slotted opening tapering continuously towards a semicircular end area viewed in a longitudinal slide-in direction, said wall having at least one detent opening; and

a holder having:

two holder halves for surrounding the round body, each

holder half having first and second end areas, and at least one of the two holder halves having a detent that engages the detent opening when the holder is slidably received in the slotted opening;

a film joint hinge connecting the two holder halves together at the first end areas;



a plug-in coupling that couples the two holder halves at the second end areas; and

a receiving section at a circumference of the holder, the receiving section extending on two sides of said wall.

4,960,253

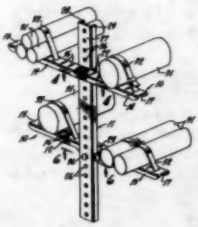
COMPACT LIGHTWEIGHT WIREWAY

Frederick Perrault, 1727 Date Ave., Torrance, Calif. 90503, and Raymond E. Perrault, 3845 Crest Rd., Rancho Palos Verdes, Calif. 90274

Filed May 4, 1989, Ser. No. 347,345

Int. Cl.[5] F16L *3/22*

U.S. Cl. 248—68.1 **12 Claims**



1. A wireway comprising a unitary member which includes an

elongated first portion adapted to support cables or the like, said first portion having opposite ends and including openings therethrough for permitting fastening members to extend through said first portion for attaching such cables thereto, and

a second portion, said second portion including,

a first part projecting from one side of said first portion intermediate the ends thereof and having an outer edge,

a second part joined to the outer edge of said first part and double over and bearing against said first part, and

opposed spaced means projecting from said second part, said opposed spaced means being adapted to receive side portions of a channel-shaped downcomer having a central web therebetween and said second part being adapted to engage the central web of said downcomer,

said first and second parts including aligned openings for receiving a fastener for attaching said unitary member to such a downcomer.

4,960,254

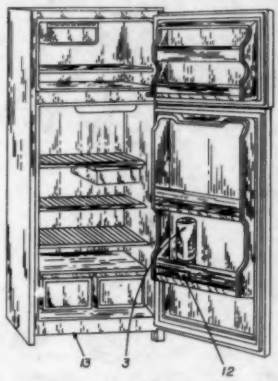
PORTABLE HOLDER TO SUPPORT A RECAPPED CONTAINER OF EFFERVESCENT LIQUIDINAN INVERTED POSITION TO RETAIN THE LIQUIDS FRESHNESS

Dennis V. Hartke, 4825 Mill Pond Loop, Auburn, Wash. 98002

Filed Nov. 29, 1988, Ser. No. 277,360

Int. Cl.[5] A47G *23/02*

U.S. Cl. 248—146 **4 Claims**



1. A portable holder in combination with a previously opened, capped container of effervescent liquid partially emptied and recapped, said holder supporting said container in an inverted position, whereby, remaining effervescent liquid therein is forced into contact about the interior of the replaced cap causing the liquid to form a seal between the cap and container to prevent the escapement of gas from the container, said combination comprising:

a surrounding hollow upright body including sides and a bottom with a top portion affixed thereon, wherein, the said top portion has a central opening which receives the inverted container and limits the lateral movement of said inverted container, wherein, the said sides of said hollow upright body extend upwardly from the said bottom a distance at least equal to the farthest distance the inverted container must protrude through the said central opening to stabilize said container in an inverted position, wherein, the said sides of said hollow upright body stabilize and support the said top portion, wherein, the said top portion stabilizes the said inverted container, wherein, the said surrounding hollow upright body including said sides and bottom form a drip basin capable of holding liquid and located beneath the central opening in said top portion to collect, if necessary, any possible seepage of liquid past the replaced cap.

4,960,255

SPRING SUPPORTED MAILBOX POST

James R. Obenshain, Peebles, Ohio, assignor to The Cedar Works, Inc., Peebles, Ohio

Filed Sep. 18, 1989, Ser. No. 408,807

Int. Cl.[5] A45F *3/44*

U.S. Cl. 248—156 **26 Claims**

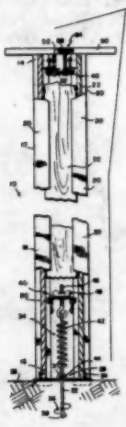
1. A post for supporting a mailbox, or the like, comprising:

anchor means for engaging the ground including an upper end,

an enclosure comprising a plurality of vertical corner-defining members spaced from each other and including a vertical slot confronting the nearest adjacent corner-defining members, a plurality of panel members situated between the corner-defining members, each of the panel

members having edges received in the slots of adjacent pairs of corner-defining members, the members having lower ends situated around the anchor means, upper ends above the lower ends, and an intermediate portion,

bracket means fixed to at least some of the members of the



enclosure within the intermediate portion for maintaining the relative position of the members, and

biasing means coupling the bracket means to the anchor means for biasing the lower ends of the vertical members toward the ground to support the enclosure in an upright position.

4,960,256

HOLDING STRUCTURE FOR DISPLAYING APPARATUS

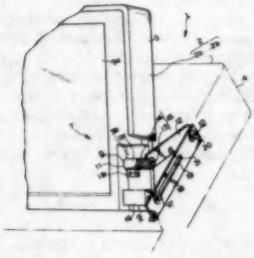
Shuichi Chihara, Tokyo; Ryuta Kanno, and Akitoshi Okuma, both of Kanagawa, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Jul. 27, 1989, Ser. No. 385,464

Claims priority, application Japan, Aug. 8, 1988, 63-197720; Dec. 19, 1988, 63-319885

Int. Cl.[5] F16M *13/00*

U.S. Cl. 248—284 **11 Claims**



1. A portable electronic apparatus having a display device, comprising: a main body of the electronic apparatus rotatably connected with the display device;

a key board mounted on an upper side portion of said main body; and

a holding structure for holding the display device rotatably connected with the main body, so that when said display device is erected by said holding structure, said keyboard and a visual displaying surface of said display device are brought to a viewing position and when said display device is laid down, said key board is covered by said display device, so that the portable electronic apparatus has a substantially compact cuboidal shape;

said holding structure being formed at a lower portion of said display device, wherein a lower edge of said display device is moved in the fore and aft direction along said main body by said holding structure.

4,960,257

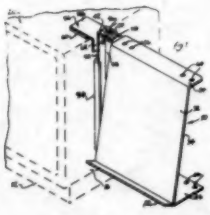
EASEL

Daniel F. Waters, 1220 Amberglen, St. Peters, Mo. 63376

Filed May 1, 1989, Ser. No. 345,489

Int. Cl.[5] B41J *11/02*

U.S. Cl. 248—442.2 **40 Claims**



1. An improved easel for supporting documents, books, notes and the like, the support means operatively associated with an easel receiving device and document support means for propping the documents in a generally upright, yet inclined and easily readable position or attitude, the improvement comprising:

a support member, the support member having a base portion adapted for attachment to a generally vertical surface of the easel receiving device, the support member having a plurality of extension means, an axis of rotation defined by the base portion such that the axis of rotation is generally perpendicular to the base portion, another axis of rotation defined by the base portion such that the other axis of rotation is generally parallel to the base portion; and

an attachment means for operatively connecting the support member and the document support means, the attachment means allowing selective relative rotational motion between the support member and the document support means about the other axis, the attachment means coextensive with at least a portion of the other axis of rotation.

4,960,258

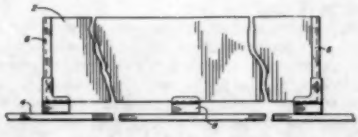
ADJUSTABLE SIGN HOLDER SYSTEM

Harold L. Stocker, Zion, and William Farr, Wheeling, both of Ill., assignors to Razz Communications, Inc., Zion, Ill.

Filed Mar. 17, 1989, Ser. No. 325,519

Int. Cl.[5] A47F *7/14*

U.S. Cl. 248—467 **25 Claims**



1. Apparatus for securing a sign element to a base with magnetic attraction comprising:

a left side support member and a right side support member, each of said support members separated from each other and free standing, and each including a support surface

and an engagement surface substantially transverse to said support surface;

a substantially linear side groove along a length of said engagement surface on each of said side support members, each of said side grooves including groove walls having a groove wall separation which substantially decreases with increasing groove depth; and

means for magnetizing at least a portion of said support surface along each of said side support members.

4,960,259

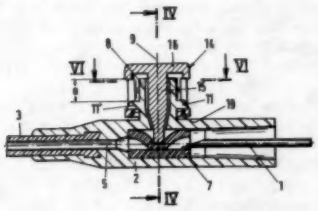
SHUT-OFF VALVE FOR A LIQUID FLOW LINE OR INFUSION DEVICE

Lars Sunnanväder, Hechingen, and Tomas Hartig, Hechingen-Bechtoldsweiler, both of Fed. Rep. of Germany, assignors to Joka Kathetertechnik GmbH, Fed. Rep. of Germany

Filed Mar. 28, 1989, Ser. No. 329,733

Int. Cl.[5] F16K *7/04*

U.S. Cl. 251—7 **5 Claims**



1. In a shut-off valve apparatus for a fluid flow device of the type having a sleeve-form casing (2) with a lateral opening (4) disposed between end-wise portions of the casing, an elastic flexible tube piece (7) lying within the casing (2) adapted to permit fluid flow therethrough, and a pressure body means (14) movable radially within the lateral opening (4) for selectively compressing the flexible tube piece (7) to stop fluid flow through the flexible tube piece (7), the improvement comprising, in combination, a guide sleeve (8) surrounding the lateral opening (4) and extending radially outwardly from the casing (2), the guide sleeve comprising at least one pair of blocking stop members (10, 10', 11, 11'), the pressure body carrying an elastic mantle (12) having a snap ring (18) depending therefrom, said snap ring (18) being engageable with at least one pair of the blocking stop members during the compression, the pressure body (14) comprising a cap (16) from which the mantle and snap ring (18) depend, the pressure body (14), cap (16), mantle (12) and snap ring (18) comprising an integral plastic structure, two pairs of blocking stops (10, 10', 11, 11') being provided which depend radially outwardly from the outside of the guide sleeve (8), each stop in a pair lying diametrically opposite from the other stop in the pair and each stop in a pair lying at the same axial distance from the casing (2) along the sleeve (8) as the other stop in the pair, wherein each pair of the blocking stops is disposed at a different height than the other pair along the sleeve (8) in the axial dimension of the sleeve (8) and wherein each pair is angularly offset with respect to the other pair in the radial direction of the sleeve (8).

4,960,260

FLUID RESTRICTING VALVE

Paul McEnearney, 53 The Crescent, Dee Why, NSW, Australia (2099)

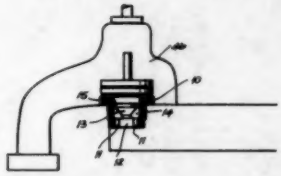
PCT No. PCT/AU87/00035, § 371 Date Dec. 7, 1987, § 102(e) Date Dec. 7, 1987, PCT Pub. No. WO87/04766, PCT Pub. Date Aug. 13, 1987

PCT Filed Feb. 10, 1987, Ser. No. 166,600

Claims priority, application Australia, Feb. 10, 1986, PH4517

Int. Cl.[5] F16K *47/08, 47/16*

U.S. Cl. 251—127 **6 Claims**



1. A fluid supply system comprising:

a source of pressurized fluid;

a control valve having an outlet, an inlet, a valve seat between the outlet and the inlet, and a through passage between the inlet and the valve seat;

piping means for fluidly coupling the outlet of the control valve to the source of pressurized fluid; and

a restrictor adapted for insertion in the through passage in the control valve, said restrictor comprising:

an annular disc, mounted within the through passage, having openings therethrough for the passage of a fluid through said openings; and

a conical element interconnected with or integral with said annular disc, the central axis of said conical element and the central axis of said disc being in alignment;

wherein the restrictor regulates the discharge rate of the fluid through the restrictor such that said discharge rate does not exceed a predetermined maximum discharge rate through said restrictor, said maximum discharge rate being below the available maximum discharge rate through the control valve when said control valve is fully open and free of said restrictor.

4,960,261

GAS CYLINDER CONNECTOR

Alistair Scott, Cambridge, and Peter F. Clark, Woodnewton, both of England, assignors to Isoworth Limited, England

Continuation-in-part of Ser. No. 25,952, Mar. 16, 1987, abandoned. This application Sep. 21, 1988, Ser. No. 247,176

Claims priority, application United Kingdom, Mar. 17, 1986, 8606557; May 17, 1988, 8811605

Int. Cl.[5] F16K *43/00*

U.S. Cl. 251—148 **35 Claims**

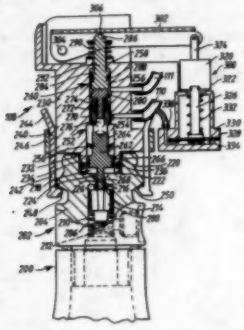
1. A female carbon dioxide supply connector for attaching a carbon dioxide supply vessel to a male connector part of a carbonation apparatus which is to utilize carbon dioxide from said vessel, said female connector comprising:

(a) a female connector part having a cylindrical recess with an open top end and a closed bottom end, the cylindrical surface of said recess being adapted to form a gas tight seal with the male connector part, said female connector part also having a passage below said recess and substantially coaxial therewith, said passage having a top end opening into the bottom of said recess and a bottom end remote from said recess;

(b) means for connecting said female connector part to a vessel containing carbon dioxide so that carbon dioxide in said vessel is supplied to the bottom end of said passage;

(c) normally closed valve means for normally blocking flow

of carbon dioxide through said passage to said recess but permitting such flow upon physical engagement and displacement, whereby said valve means can be opened by an actuator rod connected in the male connector part; and



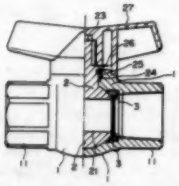
(d) positive stop means for fixing the axial position of said male connector part in said recess when said male connector part is engaged in said recess.

4,960,262

BALL VALVE AND METHODS OF FABRICATION

Mitsuharu Hashimoto, and Shinji Takeda, both of Saitama, Japan, assignors to Sekisui Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Division of Ser. No. 830,492, Feb. 19, 1986, Pat. No. 4,883,253, which is a continuation of Ser. No. 561,867, Dec. 16, 1983, abandoned. This application Jul. 18, 1989, Ser. No. 381,918
Claims priority, application Japan, Dec. 16, 1982, 57-221636
Int. Cl.[5] F16K *5/0*
U.S. Cl. 251—315 **2 Claims**



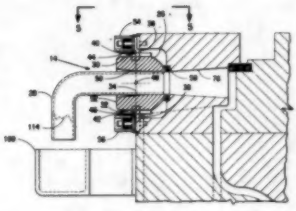
1. A method for fabricating a ball valve, comprising the steps of: inserting a ball and attached shaft into a pair of slide cores having portions extending into a flow passage in said ball; disposing a ball seat at positions surrounding each end of said flow passage in said ball, each said ball seat comprising an annular body which is provided with a plurality of grooves formed in an outer peripheral portion and side portions thereof; disposing an outer die around said pair of slide cores having a cavity therein dimensioned for forming a valve body, each said slide core having a seat holding portion for urging said ball seat toward said ball; and injecting molten resin into a cavity between said outer die and said slide cores, and into said grooves, wherein each said ball seat has an annularly shaped lip extending toward said ball, and wherein a gap is formed between a surface of said lip facing away from said ball and an adjacent surface of each said slide core located radially inwardly of said seat holding portion.

4,960,263

MOLD FILL COUPLING

John L. Hannon, Jr., Amherst, N.Y., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 28, 1989, Ser. No. 458,468
Int. Cl.[5] F16K *5/06*
U.S. Cl. 251—352 **3 Claims**



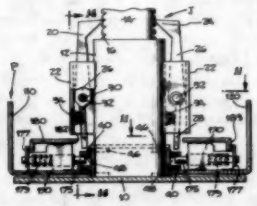
1. A mold fill coupling, comprising:
a mold housing having a mold cavity and a fill channel for fluid communication between the mold cavity and the outside of the housing;
an annular seal surrounding the fill channel at the outside of the housing;
a spherical port element having a hole through the center establishing a port axis;
means to urge the port element into the annular seal;
means to support the port element for pivotal motion about its center, the pivot axis perpendicular to the port axis so that the hole is aligned with the annulus of the seal in one pivotal position for filling the mold, and is rotated beyond the annulus of the seal in another pivotal position for sealing the mold;
a nozzle having valve means to control fluid flow therethrough, the nozzle having an elongated housing which is closely fitted in the hole in the port element, and with means to position the housing so that the end of the housing extending into the hole is aligned with the end of the hole adjacent the seal to provide a close clearance wiping action with the seal as the nozzle and port element are pivoted together until the end of the hole and housing are beyond the seal.

4,960,264

ALIGNMENT AND RELEASE MECHANISM FOR TWO-PART JACK SYSTEM

Harry H. Arzouman, Corona Del Mar, and Clyde E. Slay, Santa Ana, both of Calif., assignors to Safe-T-Jack, Inc., Huntington Beach, Calif.

Filed May 9, 1989, Ser. No. 350,111
Int. Cl.[5] B66F *5/04*
U.S. Cl. 254—8 B **5 Claims**



1. A two-part jack system comprising:
a mechanical jack stand including a vertical ratchet engageable by a spring-loaded pawl having a release arm;

a power unit having a frame portion and an operating handle, said frame portion being alignable with said jack stand;

a ratchet release member carried by said power unit frame and selectively engageable with said release arm;

a spring-loaded pin carried by said power unit said jack stand having a hole for receiving said pin to thereby establish and maintain a condition of alignment; and

a unitary control means carried by said power unit, including a control lever on said power unit handle, and means coupling said control lever to both said ratchet release member and said pin and adapted to selectively

(a) retain said pin in said hole while concurrently holding said ratchet release member in disengagement; or

(b) retain said ratchet release member in engagement with said arm while concurrently retaining said pin in said hole; or

(c) hold both said pin and said ratchet release member in positions of disengagement.

4,960,265

DEVICES FOR APPLYING PRESSURE TO A CLOSED DOOR

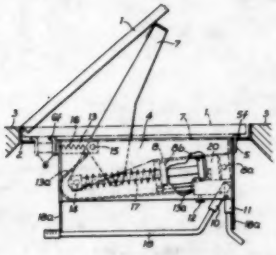
Peter W. Nichols, Nottinghamshire, Great Britain, assignor to Nichols Hydraulic Products, Ltd., Newark, United Kingdom

Filed May 11, 1988, Ser. No. 192,718

Claims priority, application United Kingdom, May 14, 1987, 8711378

Int. Cl.[5] B66F *3/24*

U.S. Cl. 254—93 R **1 Claim**



1. A device suitable for use in applying pressure to a closed door comprising:

a main frame;

a hydraulic fluid reservoir;

a first engaging member secured to the main frame and so arranged so as to be capable of engaging a first side of a door frame when the device is presented to the door;

a first hydraulic actuator mounted on the main frame;

a second engaging member in mechanical communication with said first actuator so as to be capable of being urged by said first actuator to engage a second side of the door frame which is opposed to said first side;

an arm pivotably mounted on said main frame between a retracted position and an operative position in which said arm projects beyond a plane defined by said first and second engaging members;

a second hydraulic actuator capable of urging said arm from its retracted position to its operative position to urge an end portion of said arm into engagement with the door thereby applying a force to the door to urge it open;

a holding chamber in fluid communication with said fluid reservoir and said first and second actuators;

a reciprocating plunger with a face and a back, said face being in fluid communication with said holding chamber and said first hydraulic actuator, said back being in fluid communication with said second hydraulic actuator;

a means for moving said plunger away from said holding chamber to create a suction force therein and toward said holding chamber to create a pressure force therein;

a first valve means positioned in the fluid line between said holding chamber and said fluid reservoir for allowing hydraulic fluid to flow into said holding chamber when said reciprocating plunger generates a suction force in said holding chamber while preventing hydraulic fluid from flowing out of said holding chamber back to said reservoir;

a second valve means positioned in the fluid line between said ;holding chamber and said first actuator for allowing hydraulic fluid to flow from said holding chamber to said first actuator, while preventing fluid flow in the opposite direction, when said reciprocating plunger generates a pressure force in said holding chamber which is greater than a first preselected value;

a third valve means positioned in the fluid line between said holding chamber and said second actuator for allowing hydraulic fluid to flow from said holding chamber to said second ;hydraulic actuator when said reciprocating plunger generates a pressure in said ;holding chamber which is greater than a second preselected value, said second preselected value being greater than said first preselected value; and

a fourth valve means for allowing hydraulic fluid to flow from said second actuator to said first actuator, while preventing fluid flow in the opposite direction, when the pressure in said second actuator becomes greater than the pressure in said first actuator.

4,960,266

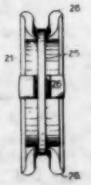
AERIAL CABLE INSTALLATION METHOD

Harvey R. McDowell, and Douglas J. Blew, both of Hickory, N.C., assignors to Siecor Corporation, Hickory, N.C.

Filed Dec. 11, 1989, Ser. No. 448,246

Int. Cl.[5] B65H *59.00*

U.S. Cl. 254—134.3 PA **10 Claims**



1. A method of installing a system for long distance outdoor communication transmissions comprising:

(a) providing a cable system comprising a strength cable and a communications cable helically wound around the strength cable;

(b) mounting a sheave to each of a plurality of spaced apart outdoor supports, each sheave having at least three inserts mounted thereto, each insert causing the strength cable and the communication cable to be in a substantially vertical orientation as they pass through the insert; and

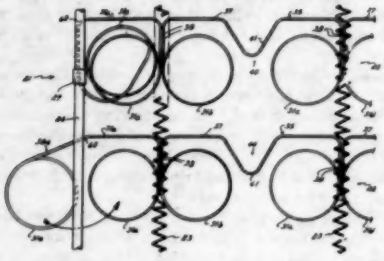
(c) pulling the cable system while the cable system is supported by a plurality of the sheaves.

4,960,267

EDGE-REINFORCED SPRING BEDDING PRODUCT

Terence A. Scott, Carthage, Mo., assignor to Leggett & Platt, Incorporated, Carthage, Mo.

Filed May 26, 1989, Ser. No. 357,534
Int. Cl.[5] A47C 27/04
U.S. Cl. 267—91 3 Claims



1. A spring interior comprising a plurality of bands of springs extending longitudinally of the spring interior, each band of springs comprising a single length of spring wire shaped to form a plurality of individual coil springs arranged in a row, one end turn of each coil spring lying adjacent to a top face of the band and the other end turn of each coil spring lying adjacent to a bottom face of the band, each coil spring being joined to adjacent coil springs by interconnecting segments integral with the coil springs, one of said interconnecting segments being located substantially in the top face of the band and the other of said interconnecting segments being located substantially in the bottom face of the band, and each interconnecting segment comprising a bridging portion which extends lengthwise of the row and a pair of endmost portions which extend transversely from opposite ends of the bridging portion, said bridging portion further including a supporting section located medially of the bridging portion, said supporting section extending transversely from the bridging portion, the bands being disposed side by side so that their top faces lie in top main face of the spring interior and their bottom faces lie in a bottom main face of the spring interior, the bands being interconnected by helical wires lying in the top and bottom faces of the bands and extending transversely across the bands, and the spring interior being characterized by at least one endmost bridging portion of each band having the supporting section thereof straightened and bent at approximately a 90° bend so as to position the endmost coil of at least one end of each band of springs in an interlaced condition throughout its length and generally coaxially aligned with the next adjacent coil of the band.

4,960,268

SPACER HOLDER ARRANGEMENT

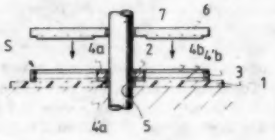
Hideo Sekiguchi; Yasuo Mitoh, and Yozi Misawa, all of Osaka, Japan, assignors to Nitto Denko Corporation, Osaka, Japan

Filed Feb. 2, 1989, Ser. No. 305,049
Claims priority, application Japan, Feb. 3, 1988, 63-14042[U]
Int. Cl.[5] B24B 4/04
U.S. Cl. 269—43 8 Claims

1. A spacer holder arrangement comprising:

(a) a support sheet having at least one aperture formed therethrough, said support sheet being of a self-supporting nature, and at least one side of said support sheet having a low adhesive-bonding ability; and

(b) a pair of concentric inner and outer spacer elements of an annular shape disposed on the one side of said support sheet to provide a preformed spacer, each of said inner and outer spacer elements having adhesive layers formed respectively on opposite sides thereof, one of said adhesive layers being interposed between each of said inner and outer spacer elements and said support sheet to bond



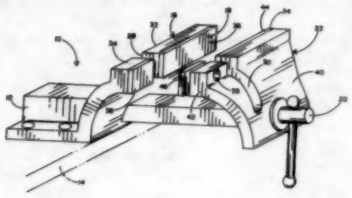
them releasably together, said inner spacer element having a central hole therethrough which is coaxial with said aperture through said support sheet so that a guide rod can be passed through said aperture and said central hole.

4,960,269

MULTI-JAW VISE

Bright K. C. Fong, 2454 Cambridge Ave., Fullerton, Calif. 92635

Filed Nov. 6, 1989, Ser. No. 432,264
Int. Cl.[5] B23Q 3/00
U.S. Cl. 269—87.2 11 Claims



1. A multi-jaw vise for clamping a workpiece and comprising:

fixed jaw means having first and second bearing faces that are spaced from one another by a slot that intersects said fixed jaw means;

movable jaw means having first and second bearing faces that are spaced from one another by a slot that intersects said movable jaw means, the first and second bearing faces of said movable jaw means positioned opposite and in substantially parallel alignment with the first and second bearing faces of said fixed jaw means, such that the slots intersecting said fixed and movable jaw means are aligned with one another in a common cutting plane for receiving a cutting tool therethrough to sever a workpiece being clamped;

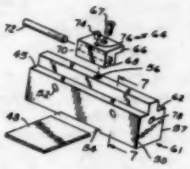
closure means cooperating with said movable jaw means to cause the first and second bearing faces thereof to be moved simultaneously with one another away from the first and second bearing faces of the fixed jaw means to open said vice and permit the insertion of a workpiece and to cause the first and second bearing faces of said movable jaw means to be moved simultaneously with one another towards the first and second bearing faces of said fixed jaw means to close said vise and clamp the workpiece; and

means cooperating with one of the bearing faces of said fixed or movable jaw means to enable said bearing face to move relative to its respective jaw means into contact with the workpiece being clamped so that when said vise is partially opened, the portion severed from the workpiece is released from said vise and the remaining portion of the workpiece remains clamped in said vice between said movable bearing face and its opposing bearing face.

4,960,270
QUICK CHANGE VISE JAW

John P. Fitzpatrick, 17174 Buckingham, Birmingham, Mich. 48009

Filed Oct. 12, 1989, Ser. No. 420,584
Int. Cl.[5] B25B 1/24
U.S. Cl. 269—282 16 Claims

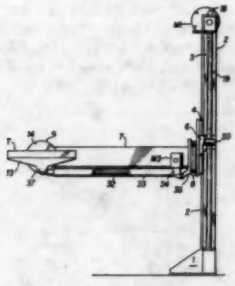


1. A vise jaw comprising:
a generally rectangular member having a longitudinal extent, a height and a width, an attachment face being defined by said longitudinal extent and said height, said attachment face having a pair of openings spaced by a first longitudinal distance, said pair of openings having a generally T-shaped cross-section in a plane defined by said longitudinal extent and said width; and
an access opening extending from each of said openings through said width and allowing access to said openings from a second face on an opposed side of said rectangular member from said attachment face, each of said access openings extending over a first area on said second face and each of said openings extending over a second area on said attachment face, said second area being greater than said first area.

4,960,271
MEDICAL PATIENT SUPPORT TABLE

John P. Sebring, Townsend, Mass., assignor to John K. Grady, Harvard, Mass.

Filed Aug. 8, 1988, Ser. No. 229,488
Int. Cl.[5] A61G 13/00
U.S. Cl. 269—323 5 Claims

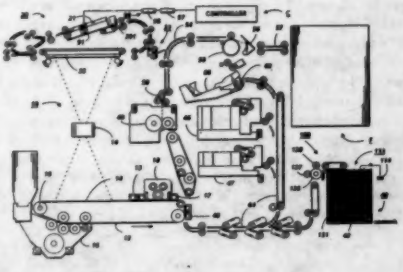


5. Apparatus for supporting a patient during medical procedures requiring access by medical personnel from alternate left and right sides of the patient, the apparatus comprising:
a floor base:
an upright standard mounted on the base and having guide rails extending upwardly therefrom;
an elevator carriage guided for vertical movement on the rails;
a first electric motor, on the standard, for raising and lowering the carriage;
a rotative coupling on the carriage;
a cantilever beam connected to the coupling and extending horizontally therefrom to turn about its longitudinal axis, the beam having a radial crank arm;
a second electric motor, on the carriage;
a drive link between the second electric motor and the crank arm having a loose, lost motion, coupling to the arm;
a collision switch on the crank arm sensing movement of the crank arm relative to the link;
a collar at the end of the beam having identically annular open ends on an axis normal to the beam;
a plate adapted to be rotatively supported in the collar at either open end;
an elongate patient table attached to the plate normal to the beam and rotatable with the plate to cant the table around an axis parallel to the length of the table;
a third electric motor, on the beam, for rotating the plate and table;
an electric power supply to the motors; and
a relay connected to the collision switch and responsive thereto the break the supply of power to the motors, so that collision of the table with an obstruction on downward movement by any of the motors stops such movement.

4,960,272
BOTTOM VACUUM CORRUGATION FEEDER STACK HEIGHT DETECTION SYSTEM CALIBRATION METHOD

Ronald R. Wierszewski, Henrietta; Richard F. Scarlata, Rochester; Thomas Acquaviva, Penfield, and James F. Matysek, Fairport, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Apr. 27, 1989, Ser. No. 344,635
Int. Cl.[5] B65H 5/22; G01C 25/00; G06M 7/00
U.S. Cl. 271—3.1 3 Claims



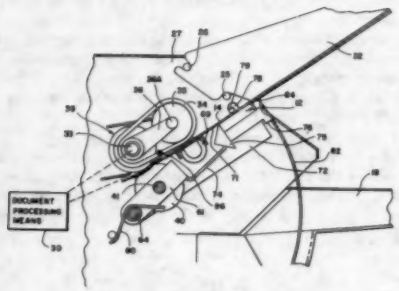
1. A method for calibrating a stack height detection system that includes a pivoting stack height arm with a rotary encoder and a sensor connected thereto in a document feeder having a document support tray, comprising the steps of: (a) pivoting the stack height arm to a first position; (b) generating a series of pulses from the rotary encoder as the stack height arm is pivoted; (c) counting the number of pulses generated by the encoder as step (b) is accomplished; (d) placing a single document into the document tray; (e) pivoting the stack height arm into a second position and contact with the document; (f) generating a series of pulses from the rotary encoder as the stack height arm is pivoted into said second position; (g) counting the number of pulses generated by the encoder as the stack height arm is pivoted into said second position; (h) calculating the height of the document by subtracting the number of pulses generated by the encoder in step (f) from the number of pulses generated by the encoder in step (b) in order to obtain a one document value; (i) storing this value in non-volatile memory; and (j) using the value from step (h) to create a table of values for various document stack heights by adding constant values to the originally obtained value of step (h).

4,960,273

DUAL MODE DOCUMENT FEEDER

Richard Frystak, Park Ridge; John S. O'Callaghan, Sr., Wilmette, both of Ill., and Jean-Jacques Colson, Incourt, Belgium, assignors to Bell & Howell Company, Skokie, Ill.

Filed Apr. 28, 1989, Ser. No. 344,710
Int. Cl.[5] B65H 5/00
U.S. Cl. 271—10 18 Claims



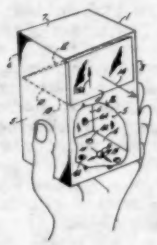
1. Document processing apparatus arranged for selective operation in automatic and manual document feed modes and including document processing means and document receiving and feeding means, said document receiving and feeding means comprising: an assembly including skimming means and document support means arranged for selective operation between an automatic condition and a manual condition, said document support means including control surface means for engagement in said automatic condition with the underside of the lowermost document of a stack of documents to position the uppermost document for engagement of the upper surface thereof by said skimming means to feed said uppermost document in a forward feeding direction to said document processing means, and said control surface in said manual condition being arranged to support a single document for direct manual feeding thereof in said forward feeding direction to said document processing means, and said document supporting means comprising a feed tray which defines said control surface means, said feed tray being supported for pivotal movement about a horizontal pivot axis and being shiftable about said pivot axis between an elevated position in said automatic condition and a lowered position in said manual condition.

4,960,274

MAZE TYPE DEVICE WITH OPTICAL COMPONENT

Shawn M. Boles, 105 N. Adams, Eugene, Oreg. 97402

Filed Sep. 11, 1989, Ser. No. 405,654
Int. Cl.[5] A63J 11/00
U.S. Cl. 272—8 M 10 Claims



1. A maze device comprising,

a housing having multiple walls including adjacent bottom and rear walls each having a maze thereon,

a movable member within said housing for support by said adjacent bottom and rear walls,

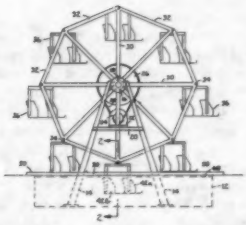
optical reflector means in said housing for deflecting light rays for viewing of the housing interior and said movable member in an illusory manner with substantially horizontal movement of the movable member appearing as vertical movement to the viewer.

4,960,275

WATER IMMERSION AMUSEMENT APPARATUS

Imrych Magon, 1906 Mariposa Ave., Los Angeles, Calif. 90027

Filed Nov. 6, 1989, Ser. No. 432,616
Int. Cl.[5] A63G 3/00
U.S. Cl. 272—32 11 Claims



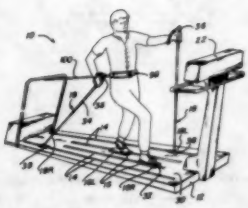
1. A water immersion amusement apparatus, com; ising a ferris wheel that includes an upstanding pedestal structure; a horizontal axle supported in an elevated position on the pedestal structure; a plural number of spokes radiating from said axle for rotation around the axle axis; a passenger compartment unit swingably suspended from the outer end of each spoke; at least one horizontal passenger platform located below the axle axis alongside the motion plane of the passenger compartment units; and a body of water below the passenger platform plane in the path of the passenger compartment units.

4,960,276

CROSS COUNTRY SKI EXERCISE APPARATUS

Mark S. Feuer, Boulder, and Eugene P. Smith, III, Westminster, both of Colo., assignors to Fittraxx, Inc., Boulder, Colo.

Filed Jun. 2, 1989, Ser. No. 360,293
Int. Cl.[5] A63B 23/00
U.S. Cl. 272—97 8 Claims



1. An exercise apparatus comprising in combination:

a. a framework,

b. a pair of foot-engaging supports mounted on said framework for reciprocal movement,

c. a pair of hand-engaging members, each being mounted on said framework and being individually associated with one of the foot-engaging supports for reciprocal movement, and

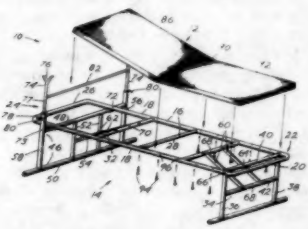
d. a control system mounted on said framework and operably interconnecting said foot-engaging supports with said hand-engaging members whereby associated foot-engaging supports and hand-engaging members are moved in opposite directions, said control system being a belt and pulley system having one way clutches mounted on a shaft with each foot-engaging support being associated with a one-way clutch and each foot-engaging support and hand-engaging member being associated with a belt forming a part of the belt and pulley system, said belt and pulley system further including a second shaft having a pair of pulleys fixed thereto with each pulley of the pair being associated with and operatively connected to a foot-engaging support, and delay means for permitting one foot-engaging support to move while the other foot-engaging support temporarily remains at a point of transition in its direction of movement, said delay means including an asymmetrical system operatively forming a part of said second shaft to permit a limited degree of relative movement between the pulleys and the associated foot-engaging supports connected thereto.

4,960,277

FOLDABLE WEIGHT LIFTER'S BENCH

Bernard J. LaRossa, 51-F Cobblestone Dr., and Mark A. Maidenburg, 51-H Cobblestone Dr., both of Chico, Calif. 95928

Filed Jan. 8, 1990, Ser. No. 462,145
Int. Cl.[5] A63B *21/078*
U.S. Cl. 272—123 **9 Claims**



1. A light-weight, foldable weight lifter's bench comprising in combination:

(a) a tubular pad support frame,

said pad support frame being generally rectangular having two longitudinal side members and two end members forming a one-piece continuous tubular peripheral frame cross braced centrally by spaced tubular members, there being a head end and a foot end thereof;

(b) a foot end leg frame,

said foot end leg frame being a generally rectangular tubular structure centrally cross braced and hingedly attached at a first end and fitting freely inside said two longitudinal side members of said pad support frame adjacent said foot end thereof, said foot end leg frame pivotally movable from a right angle relationship to said two longitudinal side members of said pad support frame to a substantially parallel position relative to said two longitudinal side members of said pad support frame, there being a transverse tubular base member for supporting said foot end leg frame against a surface terminally positioned across a second end of said foot end leg frame, said tubular base member being a stabilizer with ends extended a distance wider than the general width of said foot end leg frame;

(c) a head end leg frame,

said head end leg frame being a generally rectangular tubular structure centrally cross braced and hingedly attached at a cross member to said pad support frame adjacent said head end thereof, said head end leg frame pivotally movable for folding from a right angle relationship to said two longitudinal side members of said pad support frame to a substantially parallel position relative to said two longitudinal side members of said pad support frame, there being a tubular base member for supporting said head end leg frame against a surface terminally across a free end of said head end leg frame, said tubular base member being a stabilizer with ends extended a distance wider than a general width of said head end leg frame, said head end leg frame having two opposite side members diametrically enlarged and elongated with free ends projecting a distance beyond said two longitudinal side members of said pad support frame when said head end leg frame is right angled to said two longitudinal side members of said pad support frame, said diametrically enlarged side members being opened at terminal end of said projecting ends;

(d) two tubular barbell bar supports,

said two barbell bar supports being elongated tubular members sized to telescope inside of said diametrically enlarged side members of said front end leg frame and each tubular barbell bar support being adjustable relative to a length of each extending from said opened projecting ends of said leg frame members, said two tubular barbell bar supports having fixtures for cooperatively retaining said barbells therein;

(e) releasable locking means for retaining said foot end leg frame and said head end leg frame in said right angle relationship to said two longitudinal side members of said pad support frame and in said substantially parallel position relative to said two longitudinal side members of said pad support frame;

(f) releasable locking means for maintaining said tubular barbell bar supports in an adjusted position relative to said opened projecting ends of said diametrically enlarged head end leg frame members;

(g) a pad,

said pad having a top surface and a bottom surface and narrow peripheral sides, said top surface and said bottom surface being substantially rectangular and divided into a backrest section and a leg rest section by a substantially centered transverse hinge allowing angling of said backrest section relative to said adjustably positioned tubular barbell supports;

(e) supporting means providing adjustable elevation of said backrest section of said pad concurrent with elevational adjustment of said two tubular barbell bar supports.

4,960,278

GOLFER'S COMBINED DIVOT REPAIR AND DISTANCE MEASURING DEVICE

Melvin F. Hainey, 10609 Pinehurst Dr., Austin, Tex. 78747

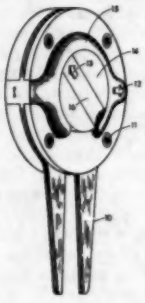
Filed Apr. 2, 1990, Ser. No. 503,794
Int. Cl.[5] A63B *57/00*; G01B *3/10*
U.S. Cl. 273—32 B **3 Claims**

1. A golfer's divot repair and distance measuring tool which comprises:

a disc-shaped handle rigidly attached to two strong prongs, whereby the proper twisting and prying force can be applied to sod for the effective repair of a divot caused by a golf ball,

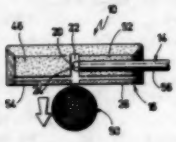
a rotatable spool of fine, man-made line contained within said disc-shape handle, attached at its outer end to a removable clamp designed to snap around a standard golf course flag stick so that the relative distance to two or more golf balls may be measured by reeling out the line, said rotatable spool containing a hinged crank by means of

which said line may be rewound and said removable clamp returned to its original position where it locks said



rotatable spool firmly into place and becomes a smooth, integral part of said disc-shaped handle.

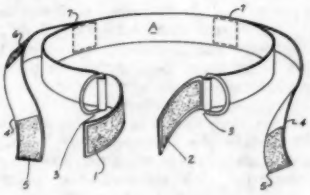
4,960,279
GOLF PUTTER
Albert F. Harris, Jr., Leawood, Kans., assignor to Intec Laboratories, Kansas City, Mo.
Filed Feb. 26, 1990, Ser. No. 484,242
Int. Cl.[5] A63B *53/04, 69/36*
U.S. Cl. 273—164 **12 Claims**



1. A golf putter head comprising:
a top surface;
a bottom surface; and
a forward-facing putting face for striking a golf ball, said face being formed of a mixture of materials including a substantial portion of one material which is a friction-resistant synthetic resin whereby the striking face of the putter has a minimal coefficient of friction with the golf ball at the point of contact.

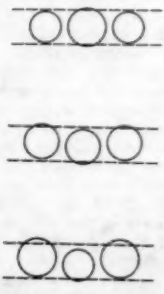
12. A golf putter comprising:
a shaft;
a putter head of a first color connected to said shaft presenting a ball engaging face and a top surface;
said top surface including an alignment line substantially perpendicular to said face, said alignment line being of a second color contrasting to said first color; and
coloring coating means of said second color applied to said shaft proximate an intersection between said shaft and said putter head, said intersection coinciding with a portion of said alignment line, said coloring coating means being applied to the portion of said shaft lying in the same vertical plane as said alignment line when said putting face is substantially vertical and said top surface is substantially horizontal.

4,960,280
TRAINING DEVICE FOR GOLFERS
William O. Corder, Jr., 1206 Stonehurst Rd., Anderson, S.C. 29621
Filed May 22, 1989, Ser. No. 354,994
Int. Cl.[5] A63B *69/36*
U.S. Cl. 273—189 R **9 Claims**



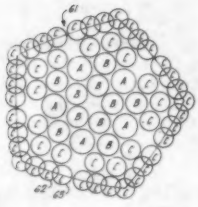
1. A golf swing training device for a golfer comprising:
a chest band for encircling an upper torso of said golfer;
attachmemt means for adjustably attaching said chest encircling band around said upper torso of said golfer;
a left arm restraining means carried on a left side of said chest band for restraining a left arm of said golfer;
a right arm restraining means carried on a right side of said chest band for restraining a right side of said golfer;
said left arm restraining mean including a strap having fastening means for fastening said strap near a first point rearward of said left arm and near a second point forward of said left arm so that said left arm of said golfer is held against said upper torso of said golfer with only slight movement of said left arm permitted relative to said upper torso generally between said first and second points; and
said right arm restraining including a strap having fastening means for fastening said arm band means near a first point rearward of said right arm and near a second point forward of said right arm so that a right arm of said golfer is held against said upper torso of said golfer with only slight movement of said right arm permitted relative to said upper torso generally between said first and second points.

4,960,281
GOLF BALL
Steven Aoyama, Marion, Mass., assignor to Acushnet Company, New Bedford, Mass.
Filed Oct. 17, 1989, Ser. No. 422,511
Int. Cl.[5] A63B *37/14*
U.S. Cl. 273—232 **13 Claims**



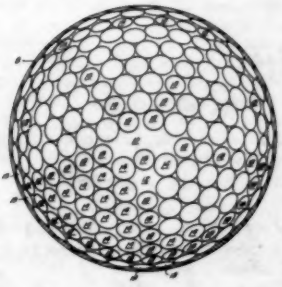
1. A golf ball having a spherical surface with a plurality of dimples formed therein and no three dimples in a row having edges that align.

4,960,282
GOLF BALLS
Michael Shaw, Wakefield, England, assignor to Dunlop Limited, United Kingdom
Continuation-in-part of Ser. No. 260,069, Oct. 20, 1988, Pat. No. 4,877,252. This application Oct. 6, 1989, Ser. No. 418,235
Claims priority, application United Kingdom, Nov. 3, 1987, 8725685
Int. Cl.[5] A63B *37/14*
U.S. Cl. 273—232 12 Claims



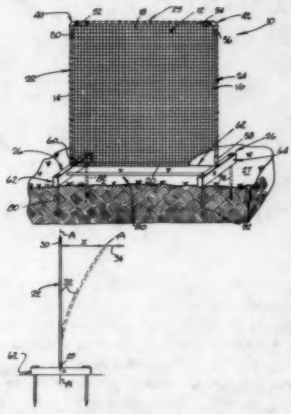
1. A golf ball having in its spherical outer surface a plurality of dimples, wherein at least 10% of said dimples are so disposed relative to one another that any two of said dimples which are adjacent each other extend inside each other to form an overlapping region, the minimum width of said overlapping region being greater than 0.02 inches (0.508 mm).

4,960,283
MULTIPLE DIMPLE GOLF BALL
William Gobush, North Dartmouth, Mass., assignor to Acushnet Company, New Bedford, Mass.
Division of Ser. No. 257,283, Oct. 13, 1988, which is a division of Ser. No. 43,218, Apr. 27, 1987, Pat. No. 4,804,189, which is a continuation-in-part of Ser. No. 18,840, Feb. 24, 1987, abandoned, which is a continuation of Ser. No. 544,780, Oct. 24, 1983, abandoned. This application Sep. 25, 1989, Ser. No. 411,749
Int. Cl.[5] A63B *37/14*
U.S. Cl. 273—232 3 Claims



1. A golf ball having dimples comprising at least 78% of the surface area of the golf ball covered by said dimples, said dimples being divided into at least two sets of dimples, a first set of dimples having an identical nominal dimple diameter and a second set of dimples having an identical nominal dimple diameter, the first set of dimples having a diameter smaller than the diameter of the second set of dimples, the golf ball being selected from the group of golf balls having a total number of dimples consisting of: 414 and 422.

4,960,284
LACROSSE PRACTICE GOAL ASSEMBLY
Rodney C. Stude, 8163 E. Mineral Dr., Englewood, Colo. 80112
Filed Oct. 4, 1989, Ser. No. 416,956
Int. Cl.[5] A63B *69/00*; F41J *1/00*
U.S. Cl. 273—395 13 Claims



1. A lacrosse practice goal assembly comprising:
(a) a generally planar, vertically disposed net having a first lateral side edge, a second lateral side edge, a top edge and a bottom edge;
(b) a first vertically disposed post means for supporting said net at said first lateral side edge thereof;
(c) a second vertically disposed post means for supporting said net at said second lateral side edge thereof;
(d) anchor means for anchoring said first and second post means to a base surface; and
(e) said first and second vertical post means each comprising a rod member having a central longitudinal axis and having flexural characteristics such that when said rod member is independently supported in cantilever beam fashion at one end thereof in a vertical position and a load of one pound is applied perpendicular to said central longitudinal axis thereof at a point thereon six feet from said supported end, said rod member deflects between one inch and thirty inches at said point of application of said one pound load.

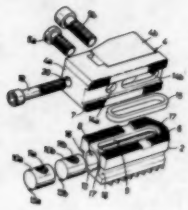
4,960,285
JAW ASSEMBLY
Katsumi Doi, 10-31, Tamakushimotomachi 1-chome, Higashi-osaka-shi, Osaka, Japan
Filed Sep. 21, 1989, Ser. No. 410,589
Claims priority, application Japan, Sep. 22, 1988, 63-125244; Jun. 16, 1989, 1-71064
Int. Cl.[5] B23B *31/16*
U.S. Cl. 279—123 2 Claims

1. A jaw assembly comprising:
a master jaw having a longitudinal axis, and top and bottom surfaces, and defining a cylindrical bore extending longitudinally therein between said top and bottom surfaces, and an elongate hole extending longitudinally of said master jaw and open at said top surface thereof,
the elongate hole spaced from the outer periphery of said top surface such that said top surface has side portions extending respectively, along sides of said elongate hole and bridging portions extending between said side portions, respectively, at ends of said elongate hole, the elongate hole having a smaller width as taken between said side portions than the diameter of said cylindrical bore, and the elongate hole open to said cylindrical bore;
a work clamping jaw adjustably fitted to said master jaw so

as to be fixable to said master jaw in a plurality of positions spaced along said longitudinal axis; and

a cylindrical seating nut and a fixing bolt fixing said work clamping jaw to said master jaw,

said cylindrical seating nut having a diameter slightly small than that of said cylindrical bore and disposed therein, and said cylindrical seating nut defining a threaded hole



therein extending perpendicular to the longitudinal axis of said cylindrical bore, and

said fixing bolt extending through said elongate hole, threaded to said seating nut and clamping said work clamping jaw to said master jaw to couple the work clamping jaw and the master jaw together in a fixed position with respect to each other.

4,960,286

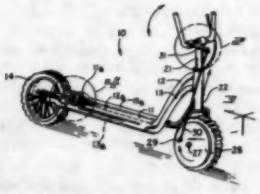
SELF-PROPELLED VEHICLE

Kerry L. Henson, 1369 David La., Frederick, Md. 21701

Filed Apr. 17, 1989, Ser. No. 339,301

Int. Cl.[5] B62M *1/14*

U.S. Cl. 280—247 **4 Claims**



1. A self-propelled vehicle comprising,

a pair of spaced elongate side horizontal supports integrally mounting at upper surfaces of the horizontal side supports of an elongate central platform, said platform further including a central horizontal support fixedly secured to the platform medially of said horizontal supports and terminating rearwardly of said platform with an upwardly extending rear vertical leg, said rear vertical leg mounting a brake assembly thereto to cooperate with a rear wheel positioned rearwardly of said brake assembly, and

said side horizontal supports and said central support extending forwardly and upwardly relative to said platform and integrally secured to a vertically oriented support cylinder relative to said platform, and

said support cylinder rotatably mounting therein a steering column, and

an upper end of said steering column pivotally mounting a "U" shaped handlebar medially of said handlebar, and

a lowermost end of said steering column secured to a forward wheel, and

a drive means mounted to said handlebar and said forward wheel to rotate said forward wheel in response to oscillation of said handlebar relative to said steering column, and

wherein said side horizontal supports extend rearwardly of said rear vertical leg and terminate in bifurcated ends to rotatably mount said rear wheel medially and rearwardly of said platform, and

wherein said drive means includes a drive disk axially and integrally mounted to a first side of said forward wheel including a drive boss extending orthogonally outwardly of said drive disk and including an elongate drive link mounted rotatably at a lowermost end of the drive link to the drive boss, and

wherein an upper end of the drive link is pivotally mounted to an elongate handlebar flange, and said handlebar flange includes a forward end pivotally mounting said drive link and includes a rear end integrally secured to the handlebar, and

wherein the handlebar includes a connecting leg wherein the handlebar flange is mounted offset from a central portion of said connecting leg and wherein said handlebar flange includes an encircling flange cylinder to integrally secure said handlebar flange to said handlebar.

4,960,287

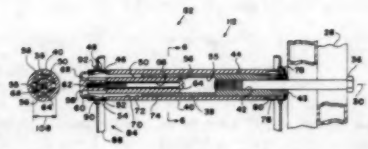
QUICK-RELEASE MOUNT FOR BATTERIES

John L. Lautzenhiser, 726 Main Street East, Hamilton, Ontario, Canada (L8M 1K9), and Gary A. Lautzenhiser, 5920 County Rd. 4, Hamilton, Ind. 46742

Filed Oct. 27, 1988, Ser. No. 263,159

Int. Cl.[5] B62B *9/12*

U.S. Cl. 280—304.1 **32 Claims**



1. Apparatus (34) for mechanically attaching a battery (24) to a foldable conveyance (10) having first and second cross-brace arms (28) that each include an upper (32) and a lower (33) end and that are foldably interconnected intermediate of said ends by a pivot pin (36), which apparatus comprises:

a first quick-release element (38) having a first end (43) that is operatively attached to said cross-brace arms intermediate of said ends thereof, and having a longitudinal axis (30) that extends generally orthogonally outward from said cross-brace arms; and

attaching means (82), comprising a second quick-release element (40) that detachably engages said first quick-release element, and that is operatively attached to said battery, for supporting said battery underneath said first quick-release element;

said quick-release elements being the sole connection between said foldable conveyance and said apparatus.

4,960,288

MOUNTING FOR FIFTH WHEEL HITCH

James W. Chambers, Rockford, Ill., assignor to Atwood Industries, Inc., Rockford, Ill.

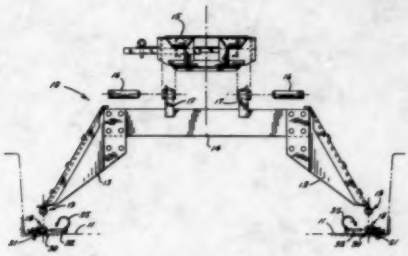
Filed Jan. 30, 1989, Ser. No. 303,636

Int. Cl.[5] B62D *53/08*

U.S. Cl. 280—423.1 **4 Claims**

1. A fifth wheel hitch adapted to be mounted in a bed of a pickup truck and adapted to be coupled releasably to a towed vehicle, said hitch comprising a pair of laterally spaced legs extending upwardly from said bed of said truck, said legs having upper and lower end portions, a supporting bar extending laterally between and fastened rigidly to the upper end portions of said legs, a coupler mounted on said supporting bar and adapted to be connected releasably to the tower vehicle, and means for releasably attaching said legs to said bed, said

means comprising first brackets connected rigidly to the lower end portions of said legs, second brackets located adjacent said first brackets, each of said second brackets being connected rigidly to said bed and each including an outwardly projecting plate and an angle member with a vertical leg, hinge curls on said first and second brackets and extending longitudinally of said bed, said vertical leg abutting said hinge curls and extending substantially coextensively therewith, the curls on each first bracket and each adjacent second bracket interleaving



with one another and forming a set of interleaved curls, each set of interleaved curls including two longitudinally spaced curls on one of said brackets and further including an intermediate curl on the other of said brackets and filling substantially all of the longitudinal space between said spaced curls, a pin extending through each set of interleaved curls to connect each first bracket releasably to the adjacent second bracket, and means holding each pin in the associated set of curls and selectively releasable to permit removal of said pin and thereby enable said hitch to be removed from said truck.

4,960,289

ENDPIECE BODY FOR SAFETY SKI BINDINGS

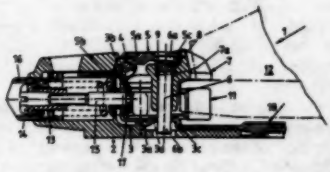
Karl Stritzl; Kurt Hoffmann; Henry Freisinger, all of Vienna; Andreas Janisch, Tribuswinkel; Egon Brunnhuber, Vienna; Johann Zotter, Vienna; Egelbert Spitaler, Neudorft; Helmut Wladar, Vienna; Reinhard Muhlberger, Enzersdorf, and Karl Dapeci, Harmannsdorf, all of Austria, assignors to TMC Corporation, Baar/Zug, Switzerland

Filed Jul. 14, 1988, Ser. No. 220,032

Claims priority, application Austria, Jul. 24, 1987, 1880/87

Int. Cl.[5] **A63C** *9/08*

U.S. Cl. 280—630 **6 Claims**



1. An endpiece for a safety ski binding attached to a ski, the endpiece comprising:

an elongated housing for disposition on the ski in the longitudinal direction of the ski;

a base plate having an opening disposed therein;

a lever pivotably mounted to said housing, said lever including a first end having a bolt opening and a second end;

sole holding means for exerting a downward force on the sole of a ski boot, and having a portion disposed beneath said lever, said sole holding means also having an elongated bore extending substantially perpendicular to the longitudinal axis of the ski;

a bolt having an enlarged head portion and an elongated smooth main portion, said head portion being received within said bolt opening, said main portion extending through said bore and said opening in said base plate, said bolt being axially moveable in said opening of said base plate in response to pivotal movement of said lever, said sole holding means being vertically slidable on said main portion of said bolt between a first position substantially abutting said lever and a second position substantially abutting said base plate;

locking means for locking said head portion of said bolt within said bolt opening;

first biasing means disposed on said bolt between said lever and said sole holding means for urging said sole holding means to said second position; and

second biasing means for exerting a force on said second end of said lever for urging said first end of said lever toward said base plate.

4,960,290

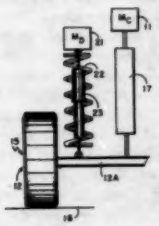
WHEEL ASSEMBLY SUSPENDING

Amar G. Bose, Wayland, Mass., assignor to Bose Corporation, Framington, Mass.

Filed May 10, 1989, Ser. No. 350,935

Int. Cl.[5] **B60G** *13/18;* **F16F** *7/10*

U.S. Cl. 280—692 **35 Claims**



1. In a vehicle having a sprung mass and an unsprung mass including a wheel and a wheel support member, suspension apparatus comprising,

a nonlinear active dynamically controlled suspension system intercoupling said sprung mass and said unsprung mass,

a wheel damper,

and a wheel damper supporting structure connecting said wheel damper to said wheel support member constructed and arranged to prevent transfer of force between said unsprung mass and said sprung mass through said wheel damper.

4,960,291

AUTOMOTIVE SUSPENSION SYSTEM

Chien-Hung Lin, No. 150, Chung-Hsiao Rd., Chia-Li Chen, Tainan Hsien, Taiwan

Filed Jun. 6, 1989, Ser. No. 362,291

Int. Cl.[5] **B60G** *17/00*

U.S. Cl. 280—710 **4 Claims**

1. A suspension system for a motor vehicle having at least one control arm for pivotably connecting one of the wheels of the motor vehicle to the frame of the vehicle comprising:

a suspension cylinder having a housing and a piston with a piston rod formed thereon, said housing being secured to the vehicle frame, said piston moving in said housing with said piston rod thereon being connected to the control arm of the wheel;

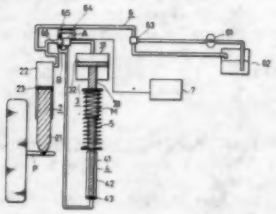
a primary hydraulic cylinder having a housing and a piston which is movable therein, said piston having a piston rod

formed thereon, said housing of said primary cylinder being secured to the vehicle frame and hydraulically communicating with said housing of said suspension cylinder through a first fluid pipe;

an auxiliary hydraulic cylinder having a housing and a piston which is movable therein with a piston rod formed thereon, said housing of said auxiliary cylinder being secured to the vehicle frame and hydraulically communicating with said housing of said suspension cylinder through a second fluid pipe;

a combination coil-spring and shock absorber installed and secured between said piston rods of said primary and auxiliary hydraulic cylinders; and

a control means for controlling the flow of hydraulic fluid



from said suspension cylinder to said primary hydraulic cylinder and to said auxiliary hudraulic cylinder;

said primary hydraulic cylinder having a sectional diameter which is larger than that of said suspension cylinder, and said auxiliary hydraulic cylinder having a sectional diameter which is smaller than that of said suspension cylinder;

said control means, in response to a first ooperative state of the vehicle in which the wheel thereof is facing straight ahead, directing the flow of the hudraulic fluid from said suspension cylinder into said primary hydraulic cylinder through said first fluid pipe and, in response to a second operative state in which the wheel is turned to the left or right, directing the flow of the hydraulic fluid from said suspension cylinder into said auxiliary hydraulic cylinder through said second fluid pipe.

4,960,292

AIR BAG RESTRAINT SYSTEMS

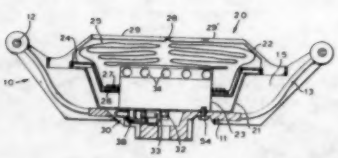
Stephen J. Sadler, Nuneaton, United Kingdom, assignor to Jaguar Cars Limited, England

Filed Oct. 11, 1989, Ser. No. 420,142

Claims priority, application United Kingdom, Nov. 1, 1988, 8825540

Int. Cl.[5] B60R *21/16*

U.S. Cl. 280—731 **7 Claims**



1. An air bag restraint system comprising an air bag module adapted to be located centrally of a steering wheel and secured with respect thereto by at least one fastening means, said air bag module including an inflator and screw means for arming said inflator, interlock means being associated with said screw means which will, prevent release of said fastening means until the inflator has been disarmed and provide an indication of the inflator being armed and disarmed.

4,960,293

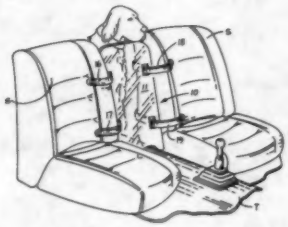
ANIMAL SHIELD

Martin Bottinick, and Miriam Bottinick, both of 9106 Wagtail Dr., Austin, Tex. 78748

Filed May 2, 1989, Ser. No. 346,595

Int. Cl.[5] B60R *21/06*

U.S. Cl. 280—749 **2 Claims**



1. An animal shield to contain an animal within a rear passenger compartment of an automobile, said shield configured for securement to span a fixed distance between a plurality of seats within a forward passenger compartment of said automobile, said shield comprising,

a solid planar flexible polymeric member formed of memory retentent material defined by an elongate upper edge spaced above a lower edge, said lower edge including an arcuate recess formed medially of said lower edge to accommodate a transmission tunnel therein, and

further including clamp means for securement of said shield to confronting sides of the spaced seats, and

wherein the clamp means includes a first pair of upper clamps aligned with one another, and spaced above a pair of lower clamps, said lower clamps defining a plurality of clamps aligned with one another, and wherein the upper clamps and lower clamps are oriented adjacent opposed sides of the shield, and

wherein the upper clamps are slidably received within upper slots formed orthogonally through the shield, the upper slots are each aligned with one another and are spaced apart a first distance, and the upper slots are of a length greater than the width of the upper clamps to enable the upper clamps to be slidably positionable within the upper slots, and further including a pair of aligned lower slots slidably receiving the lower clamps respectively therewithin, the lower slots of a length greater than the lower clamps, and the lower slots spaced apart a second distance, and

wherein the first distance is greater than the second distance, and

wherein the opposed sides of the shield taper downwardly from the upper edge of the lower edge, and

wherein each of the clamps is of a generally "C" shaped configuration, and the clamps further include spring biased opposed legs for securement of a respective seat within the legs, and

wherein each of the legs includes an exterior padding and an interior padding, and

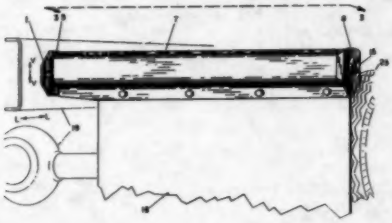
wherein the interior padding is formed of compressible material and is of a width less than that of the leg of the "C" shaped clamp when the compressible, material is not subject to compressions and the exterior padding is of a greater density than the interior padding and is formed coextensively with the width of each leg of each "C" shaped clamp.

4,960,294

TRUCK MUD FLAP SUPPORT ARM

Charles F. Leonard, Rte. 1, Box 99, Star, Id. 83669

Continuation-in-part of Ser. No. 245,703, Sep. 15, 1988, Pat. No. 4,877,267. This application Aug. 21, 1989, Ser. No. 397,017
Int. Cl.[5] B12B 9/16
U.S. Cl. 280—848 16 Claims



1. A deflectable support arm assembly for mounting mud flaps and the like on a vehicle comprising:

an elongated tubular support arm for supporting a mud flap;

mounting means for pivotally mounting said elongated tubular support arm at a first end thereof to a vehicle, said mounting means adapted for providing pivotal movement of said elongated tubular support arm about a vertical and a horizontal axis adjacent said first end; and

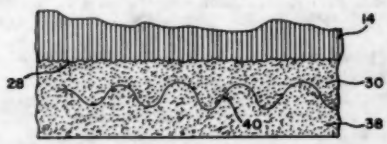
resilient means disposed within said elongated tubular support arm and connected between said mounting means and a removable external end cap positioned at a second end of said elongated tubular support arm, a first end of said resilient means being offset from a second end of said resilient means with respect to a longitudinal centerline of said elongated tubular support arm that a vertical force is exerted on said elongated tubular support arm, said resilient means urging said elongated tubular support arm in a first position, said resilient means allowing said elongated tubular support arm to pivot about said vertical and horizontal axis of said first position, said resilient means urging said elongated tubular support arm to return to said first position when said elongated tubular support arm is out of said first position, said removable external end cap including a lug removably coupling said resilient means to said removable external end cap, said resilient means urging said removable external end cap against said second end of said elongated tubular support arm and retaining said removable external end cap in place.

4,960,295

TWO-SHOT HOT-MELT BOOKBINDING

John Bodouroglou, Oak Park, Ill., assignor to Eschem Inc., Downers Grove, Ill.

Filed Sep. 27, 1988, Ser. No. 249,910
Int. Cl.[5] B42C 9/00
U.S. Cl. 281—15.1 9 Claims



1. A perfect bound book bound by two-shot hot-melt bookbinding formulations, comprising: a plurality of sheets forming a book block, said book block having a backbone of a set adhesive system which includes a layer of a hot-melt primer formulation adhered to a spine end of said sheets and a hot-melt cover glue formulation over said primer formulation;

said hot-melt primer formulation containing a primer backbone polymer and having a viscosity of between about 1100 cps and about 2500 cps at a temperature of 350° F., said primer backbone polymer including between about 30 and about 50% by weight of said primer of an ethylene-based polymer; and

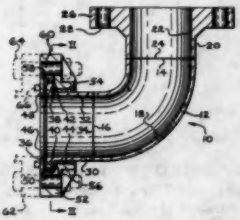
said hot-melt cover glue formulation contains a cover glue backbone polymer and has a viscosity greater than the viscosity of said primer formulation at a temperature of 350° F.

4,960,296

GALVANIC ISOLATOR CONDUIT FITTING

William G. Thelen, Onondaga, Mich.; Rodney E. May, Ohio City, and David L. Gilbert, Paulding, both of Ohio, assignors to Aeroquip Corporation, Jackson, Mich.

Filed Sep. 11, 1989, Ser. No. 405,774
Int. Cl.[5] F16L 55/00
U.S. Cl. 285—50 3 Claims



1. A conduit fitting characterized by its standard configuration, galvanic isolation and unitary construction comprising, in combination, a metal conduit fitting having a body, first and second ends defined on said body and a passage defined in said body intersecting said ends, a radially extending shoulder defined on one of said body ends having a periphery and inner and outer radial faces, a homogeneous one-piece dielectric galvanic insulation sleeve engaging said shoulder periphery, faces and the conduit adjacent said shoulder, an annular mounting flange mounted on said shoulder encompassing said shoulder and conduit adjacent said shoulder and an annular radial face plate mounted in opposed relation to said shoulder outer face, said insulation sleeve being located between said mounting flange and shoulder faces and periphery and between said face plate and said should outer face whereby said flange and conduit are galvanically insulated from each other and comprise a unitary assembly.

4,960,297

DOUBLE ACTION LATCH

James R. Bouse, Belmont, and John P. Conner, Grandville, both of Mich., assignors to Component Hardware Group, Inc., Lakewood, N.J.

Filed Sep. 28, 1989, Ser. No. 413,958
Int. Cl.[5] F05C 3/16
U.S. Cl. 292—223 22 Claims

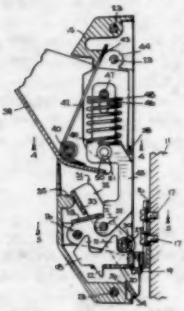
1. A double action latch comprising

a strike having a pair of latches disposed on one side and a stop disposed on an opposite side;

a pivotally mounted bracket unit having a roller for sequentially engaging said latches;

a movable plate for engaging said stop; and

actuating means connected to said bracket unit and said plate for pivoting said bracket unit to move said roller out of



engagement with a respective latch and for moving said plate into engagement with said stop.

4,960,298

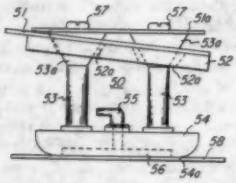
SEMICONDUCTOR WAFER PICK-UP DEVICE

Masayuki Morei, Tsuchiura, Japan, assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 20, 1988, Ser. No. 287,367

Int. Cl.[5] B25J *15/06*

U.S. Cl. 294—64.1 **7 Claims**



1. A pick-up device for moving a semiconductor wafer, the pick-up device being mounted on a mechanical or robotic arm having an extension, the pick-up device comprising:

an upper plate;

a lower pick-up head;

two mounting posts having upper and lower ends, the upper ends being conical shaped; and

a vacuum cavity in the pick-up head;

the upper plate being attached to the upper ends of the two mounting posts,

the lower pick-up head being attached to the lower ends of the two mounting posts,

the two mounting posts resting within two holes in the robotic arm, but not fixedly attached to the robotic arm extension, such that when the robotic arm is lowered, the lower pick-up head remains parallel to the robotic arm extension until the lower pick-up head engages a semiconductor wafer, at which time the lower pick-up head moves in direction to position the pick-up head parallel to the semiconductor wafer independent of the orientation of the robotic arm extension with respect to the semiconductor wafer.

4,960,299

MOBILE ACCOMMODATION STRUCTURE WITH EXTENSION UNIT

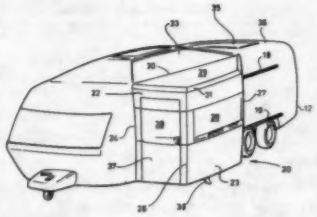
William D. Steadman, 2 Pond Walk, Hayle, Cornwall, England

Filed Jul. 6, 1989, Ser. No. 376,367

Claims priority, application United Kingdom, Jul. 6, 1988, 8816140

Int. Cl.[5] B60P *3/32*

U.S. Cl. 296—26 **14 Claims**



1. A mobile accommodation structure having:

two opposite side walls, a floor and a roof,

at least one foldable extension erectable from at least one of said two opposite side walls to enlarge the interior volume of said mobile accommodation structure,

said foldable extension having a wall structure including:

a first wall panel having a first edge and a second edge,

means pivotally and slidably connecting said first edge of said first wall panel to said at least one of said two opposite side walls of said mobile accommodation structure,

a second wall panel having a first edge and a second edge,

means pivotally interconnecting said first edge of said second wall panel to said at least one of said two opposite side walls of said mobile accommodation structure,

means pivotally interconnecting said second edge of said second wall panel and said second edge of said first wall panel whereby to allow movement of said foldable extension between an erected position in which said first wall panel lies at an angle to said one of said two opposite walls and a storage position in which said first wall panel lies generally parallel to said one of said two opposite walls and displaced parallel thereto from its erected position,

a roof panel member movable between an erected position in which it overlies said wall structure and a storage position, and

a movable floor panel displaceable between an erected position in which it lies parallel to and coplanar with said floor of said mobile accommodation structure within the volume defined by said erected wall structure, and a storage position.

4,960,300

HOPPER EXTENSION DEVICE

Arvard C. Burvee, Rte. 1, Box 406, Fairmount, N. Dak. 58030

Filed Nov. 29, 1989, Ser. No. 442,706

Int. Cl.[5] B62D *33/027*

U.S. Cl. 296—34 **6 Claims**

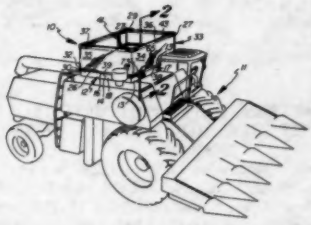
1. An adjustable hopper extension device for attachment to the hopper of a combine, the combine hopper having an open top and opposed vertical walls, said hopper extension device comprising:

similar upper and lower rectangular-shaped frames, each including opposed pairs of frame members, means rigidly interconnecting adjacent ends of the frame member of each of said frames, means securing the lower frame to the upper edge portion of the walls of the combine hopper,

a flexible wall structure comprising opposed pairs of flexible vertical panels, each panel having an upper sleeve along

its upper portion and a lower sleeve along its lower portion, each upper sleeve receiving a frame member of said upper frame therethrough, each lower sleeve receiving a frame member of said lower frame therethrough,

means interconnecting the upper frame member with the combine hopper for shifting the hopper extension attachment between erect and collapsed positions, said means including a plurality of over-center toggle linkages, each comprising an elongate upper toggle link and an elongate lower toggle link, means pivotally interconnecting each upper toggle link with an upper frame member, means



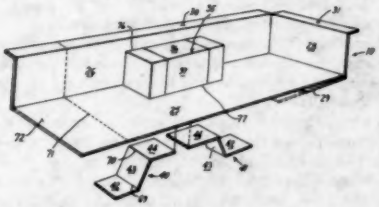
pivotally connecting each lower toggle link with the vertical wall of a combine hopper, pivot means interconnecting one end of the lower toggle link with the upper toggle link intermediate the ends of the latter, the toggle links of each toggle linkage being vertically disposed and releasably locked in an over-center condition when the hopper extension device is in the erect condition, whereby the upper frame is spaced above the lower frame and the vertical panels are taut, and the toggle links of each toggle linkage being disposed substantially horizontally when the hopper extension attachment is in the collapsed position to thereby position the upper frame upon the lower frame.

4,960,301

DISPOSABLE LINER FOR PICKUP TRUCK BEDS

Steven A. Fry, 30052 Running Deer La., Laguna Niguel, Calif. 92677, and Rodney L. Stafford, 4900 E. Chapman #13, Orange, Calif. 92669

Filed Mar. 27, 1989, Ser. No. 328,840
Int. Cl.[5] B62D *33/02*
U.S. Cl. 296—39.2 **3 Claims**



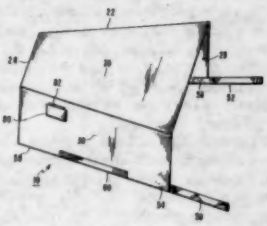
1. A liner half for forming part of a liner to cover a pickup truck bed, said truck bed having a bottom, two side walls, and a front wall, said liner half being formed from an initially flat blank folded to form a conforming bottom panel, a sidewall panel, a front wall panel, and a front bottom panel, a dihedral fold edge being formed between the sidewall panel and the front wall panel, and between the front wall panel and the front bottom panel, the blank having scores to facilitate the location and folding of the liner half to form said dihedral fold edges; said blank including contiguous to its front bottom panel, a pair of filler panels detachable therefrom at a score, said filler panels being scored to facilitate folding to fit the filler panels closer to the wheel well.

4,960,302

SHOPPING CART BONNET

Peter C. Walters, P.O. Box 2586, Hamilton Square, N.J. 08690

Filed Oct. 30, 1989, Ser. No. 428,985
Int. Cl.[5] B60P *7/02*
U.S. Cl. 296—100 **3 Claims**



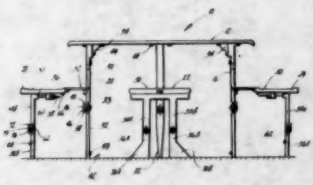
1. In an article of manufacture comprising a bonnet means for covering a shopping cart wherein said bonnet means is further adapted for use as a protective means for shielding an upper portion of the cart from solar radiation, dust and water, said article further comprising a trapezoidal panel generally corresponding to the open top of the shopping cart having a first edge and a second edge innerconnected by a third edge, a first rectangular panel attached at said first edge, a second rectangular panel attached at said second edge, a third rectangular panel innerconnecting said first and second panels and attached at said third edge for covering the top, front and sides of the shopping cart said article further comprising attaching means for attaching said article to said shopping cart, said attaching means comprising a pair of strips attached to said first and second rectangular panels, said strips being adapted for tying said strips together, comprising advertising indicia made of glow-in-the-dark paint and disposed on at least one of said panels for advertising.

4,960,303

FOLDING TABLE AND SEAT ASSEMBLY

Melvin B. York, 2941 Seymour Lake Rd., Apt. B1, Oxford, Mich. 48051

Filed Sep. 18, 1989, Ser. No. 408,893
Int. Cl.[5] A47B *39/00*
U.S. Cl. 297—159 **2 Claims**



1. A folding table and seat assembly comprising:

a planar table top having a lower side;

a plurality of leg means connected to the lower side of the table top, each of the leg means including an upper leg member and a lower leg member, each upper leg member having an upper end and a lower end, and each lower leg member having an upper end and a lower end;

first hinge means connecting the upper end of the upper leg member to the lower side of the table top such that the

upper leg member is movable between a closed position substantially parallel to the lower side of the table top, and an open position in which the upper leg member is disposed generally normal to the table top, so as to cooperate with the other upper leg members to support the table top in a horizontal position at such times as the lower end of the upper leg members are disposed on a supporting surface;

second hinge means connecting the upper end of the lower leg members to the lower end of the upper leg members such that when each upper leg member is in said open position, the lower leg member is movable between a first position in which it is disposed closely adjacent and parallel to the upper leg member, permitting the lower end of the upper leg member to engage the supporting surface, and a second position in which the lower leg member is disposed beneath the upper leg member to support same in a raised position;

seat means connected to at least one of the leg means, the seat means including a seat member and a seat leg member;

third hinge means for connecting the seat means to the leg means such that the seat means is movable between a closed position in which it is disposed adjacent to and parallel to an upper leg member, and an open position in which the seat means is disposed generally at right angles to the leg means;

fourth hinge means connecting the seat leg member to the seat member such that the seat leg member is movable between a closed position in which it is disposed beneath and parallel to the seat member, and an open position in which the seat leg member is disposed beneath the seat member to cooperate with the leg means in supporting the seat member in a generally horizontal position; and

each of said leg means and each of said seat means being movable to a fully collapsed position in which the seat member is disposed on one side of the upper leg member and the lower leg member is disposed on the opposite side of the upper leg member, and the seat leg member, the upper leg member and the lower leg member are all disposed parallel to and adjacent the lower side of the table top.

4,960,304

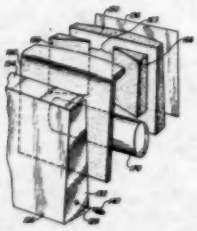
CONTOUR RETAINING BACK SUPPORT CUSHION

Ronald F. Frantz, Barrington, Ill., assignor to Internatinal Healthcare Products, Inc., Northbrook, Ill.

Division of Ser. No. 347,170, May 3, 1989, Pat. No. 4,930,171. This application Feb. 7, 1990, Ser. No. 476,958

Int. Cl.[5] A47C *7/40*

U.S. Cl. 297—284 **19 Claims**



1. A portable cushion for supporting the back of a seated human body said cushion adapted to be removably positioned adjacent a seating surface comprising:

a flexible, airtight casing having at least a front support layer and a rear bearing layer, said casing having a lower region to be disposed adjacent a lower region of the back and an upper region to be disposed adjacent an upper region of the back;

valve means mounted to said casing for communicating with the interior of said casing and operable for preventing or permitting flow of air through said valve means into and out of said casing;

a rear layer of resilient foam material positioned on said casing rear bearing layer and extending into said upper and lower regions of said casing;

a fluid-filled pad positioned in front of a portion of said rear layer of resilient foam material in said lower region of said casing;

at least one upper mass of resilient foam material extending upwardly from said fluid-filled pad in said casing upper region; and

a front layer of resilient foam material disposed to extend over said upper mass of resilient foam material and said fluid-filled pad.

4,960,305

AIR COMPRISING SUPPORTS FOR THE POSTERIOR AND THE SHINS, RESPECTIVELY, OF A CHAIR OCCUPANT

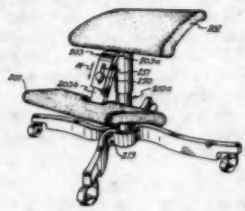
Peter Opsvik, Hogtunveien 12, 1370 Asker, Norway

Continuation-in-part of Ser. No. 869,834, May 23, 1986, which is a continuation of Ser. No. 675,837, Nov. 15, 1984, abandoned. This application Dec. 10, 1987, Ser. No. 131,374

Claims priority, application Fed. Rep. of Germany, Mar. 17, 1983, 307879; May 4, 1983, 313203

Int. Cl.[5] A47C *7/50*

U.S. Cl. 297—423 **19 Claims**



1. A swivel stool or chair, comprising, in combination:

a base member;

a substantially vertical supporting column extending upwardly from said base member;

a substantially flat forwardly and downwardly slanting set support arranged at a first level at the top area of said column for supporting the posterior of a stool user;

a substantially flat shin support spaced from and disposed at a second level below and forward of said seat support, and slanting in the opposite direction thereof rearwardly and downwardly;

means for interconnecting said seat support and shin support to allow for said spaced relationship, so that the user with his posterior resting on the seat support can assume a kneeling-like posture to distribute the body weight by resting the shines of his legs on said shin support, thereby permitting a natural, kneeling-like posture of balance with a substantially vertical position of the torso;

the seat and shin support interconnecting means including an elongated frame member, the frame member having a first end and a second end opposite the first end, the shin support being mounted on the frame member in proximity to the first end thereof, the seat support being mounted on the frame member in proximity to the second end thereof, and the frame member being rotatably mounted to the vertical supporting column; and

means mounting said seat support for simultaneous adjustment of the height of said seat and shin supports relative to said base member, said seat support being mounted so that

said column is substantially forward of the center of said seat support.

4,960,306

OPEN-CUT MINING CUTTER

Thorwald Kipp, and Bernhard Wiechers, both of Bad Oeynhausen, Fed. Rep. of Germany, assignors to O&K Orenstein & Koppel Aktiengesellschaft, Dortmund, Fed. Rep. of Germany

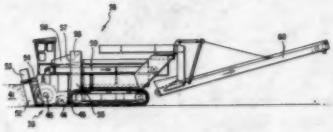
PCT No. PCT/EP87/00185, § 371 Date Oct. 7, 1988, § 102(e) Date Oct. 7, 1988, PCT Pub. No. WO87/06301, PCT Pub. Date Oct. 22, 1987

PCT Filed Apr. 4, 1987, Ser. No. 272,750

Claims priority, application Fed. Rep. of Germany, Apr. 7, 1986, 3611580; Jun. 25, 1986, 3621420

Int. Cl.[5] E21C *47/00*

U.S. Cl. 299—41 **13 Claims**



12. Open-cut mining cutter comprising:

a crawler unit having a superstructure and a substructure;

an excavating device for recovering bulk material, said excavating device including bearing and drive regions;

approximately vertically arranged shearing drums for cutting free said bearing and drive regions, said shearing drums having upper ends inclined obliquely forward; and

a conveying means for conveying bulk material from said excavating device, wherein said conveying means comprises worm conveyors disposed to the left and right immediately behind said excavating device and said worm conveyors include picks for shearing off ground surface.

4,960,307

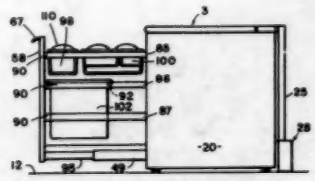
VERTICAL STORAGE UNIT FOR MODULAR FURNITURE

Randall P. Nelsen, Alto, Mich., assignor to Steelcase, Inc., Grand Rapids, Mich.

Filed Feb. 7, 1989, Ser. No. 307,682

Int. Cl.[5] A47B *17/00*

U.S. Cl. 312—194 **17 Claims**



1. In combination, modular furniture, of the type which includes at least one worksurface with a front edge and an open knee space therebelow, and a vertical storage unit therefor, comprising:

a hollow, vertically extending cabinet shaped to be supported in a generally vertical orientation underneath the worksurface at a location laterally adjacent to one side of the knee space;

a drawer having a front panel, a rear panel, and a rigid, open framework interconnecting, said front and rear panels, said framework having opposite sides, and including at least two open frames disposed in a vertically stacked relationship, with each of said open frames having a generally closed perimeter;

means for slidably mounting said drawer in said cabinet for generally horizontal movement in a direction substantially perpendicular to the front edge of the worksurface between a closed position wherein a major portion of said open framework is disposed inside of said cabinet body, and an open position wherein a major portion of said open framework is disposed outside of said cabinet body, and protrudes outwardly therefrom beyond the worksurface;

a plurality of individual storage elements adapted to retain objects therein, and shaped to drop into one of said open frames and be removeably supported from the closed perimeter thereof in a hanging fashion; said storage elements being removably mounted in said open framework in a vertically spaced apart relationship; both sides of said open framework being open to laterally access each of said storage elements from either side of said drawer; said storage elements each being shaped to receiver and remove objects therefrom with a generally vertical motion when said drawer is in the open position, whereby convenient storage is provided within arm's length of the worksurface without encroaching upon the knee space to provide improved freedom of movement, particularly in task environments.

4,960,308

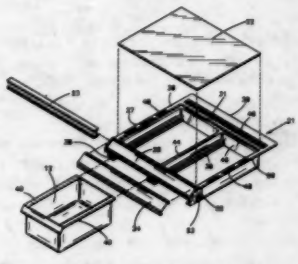
SUPPORT SHELF FOR CRISPER DRAWERS IN REFRIGERATORS

David J. Donaghy, Gowen, Mich., assignor to White Consolidated Industries, Inc., Cleveland, Ohio

Filed Oct. 3, 1989, Ser. No. 416,654

Int. Cl.[5] F25D *11/00*

U.S. Cl. 312—214 **9 Claims**



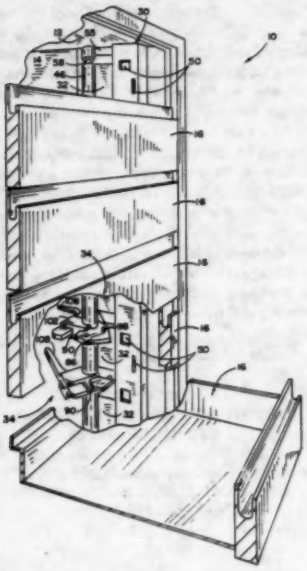
8. A refrigerator comprising a cabinet defining a portion of a refrigerated food storage compartment, a crisper drawer support shelf mounted in said chamber adjacent the lower end thereof, and a plurality of crisper drawers supported on said crisper drawer support shelf for movement between a closed position in which they are covered by said support shelf and an open position extending forwardly therefrom, said support shelf including a molded plastic frame member providing side portions and front and back portions, said frame member providing opposed pairs of tracks supporting an associated of said crisper drawers, said frame member defining a generally rectangular opening along the upper surface thereof, a transparent cover member supported in said opening, a decorative strip of sheet material mounted on said front portion of said frame member, said frame member providing a tunnel-like opening extending along said front portion, and an extruded aluminum I-beam positioned in said tunnel opening providing said front portion of said frame member with sufficient strength to support loads thereon, said frame member obscuring said I-beam from view from in front and above.

4,960,309

DRAWER LOCK AND INTERLOCK MECHANISM

Douglas Scheerhorn, Byron Center, Mich., assignor to Steelcase Inc., Grand Rapids, Mich.

Filed Nov. 29, 1988, Ser. No. 277,569
Int. Cl.[5] E05C 7/06
U.S. Cl. 312—221 14 Claims



1. An interlock mechanism for use in a unit having an interior surface, at least two drawers and means for slidably mounting the drawers within the housing, said interlock mechanism comprising:

at least two control bars;

guide means defining a channel having closed ends for slidably supporting the control bars within the housing for vertical movement along the interior surface, adjacent control bars being movable from a contacting position to a spaced position;

at least two interlock cams, each cam defining a cam portion;

mounting means engaging said interlock cams for pivotally mounting said cams on the unit and adjacent said channel for movement from a first inoperative position to a second, operative position in engagement with one of said control bars, said bars and said cam portions being dimensioned so that when one of said cams is in its second position, further movement of the bars is prevented and the remaining cams cannot move to their second positions;

at least two control members, each member operatively associated with one of the drawers so that movement of a drawer from a closed position towards an open position causes the control member to engage a respective one of said interlock cams so that further opening movement is possible only if such cam can move to its second position; and

holding means on said cams from holding said cams in said second position;

said holding means comprising:

a pair of detent projections, one extending upwardly and the other downwardly from said cam; and

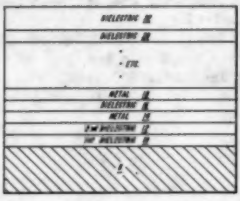
means on said control bars for receiving said detent projections when said cam is in its second position.

4,960,310

BROAD BAND NONREFLECTIVE NEUTRAL DENSITY FILTER

David H. Cushing, North Reading, Mass., assignor to Optical Corporation of America, Westford, Mass.

Filed Aug. 4, 1989, Ser. No. 389,545
Int. Cl.[5] G02B 5/20, 5/22
U.S. Cl. 350—1.7 10 Claims



1. A neutral density optical filter, comprising:

a transparent substrate;

a layer of a first dielectric material on said substrate;

a layer of a second dielectric material on said layer of first dielectric material;

a plurality of layers of metallic material, the first of said layers of metallic material being located on said layer of second dielectric material;

at least one spacing layer of dielectric material, each spacing layer of dielectric material being located between successive layers of said metallic material;

a capping layer of dielectric material on the last of said layers of metallic material; and

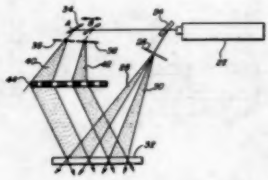
a terminating layer of a dielectric material different from said capping layer of dielectric material and located on said capping layer.

4,960,311

HOLOGRAPHIC EXPOSURE SYSTEM FOR COMPUTER GENERATED HOLOGRAMS

Gaylord E. Moss, Marina del Rey, and John E. Wreede, Monrovia, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Aug. 31, 1989, Ser. No. 401,394
Int. Cl.[5] G03H 1/08
U.S. Cl. 350—3.66 5 Claims



2. A system for exposing a hologram comprising:

a recording medium;

a computer generated diffraction means for providing a first wavefront when illuminated, said diffraction grating being positioned next to the recording medium;

means for directing a point source of illumination at the diffraction grating and for relatively moving said point source during the exposure of the recording medium;

means for providing a second wavefront to the recording medium whereby the respective first and second wave-

fronts interact to form the desired interference pattern in the recording medium; and

means for varying the wavelength of the point source to compensate for any variations in formation of fringe spacing in the recorded interference pattern.

4,960,312

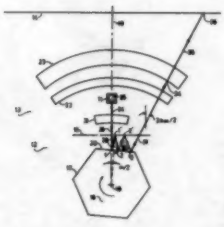
COMPACT HIGH RESOLUTION HIGH SPEED SYMMETRICAL SCANNING OPTICS USING MULTIPLE DEFLECTIONS

Mahmoud Razzaghi, 7469 Daytona St. #1, Lemon Grove, Calif. 92045

Filed Oct. 10, 1989, Ser. No. 419,252

Int. Cl.[5] G02B *26/08, 26/10*

U.S. Cl. 350—3.71 **25 Claims**



1. A flying spot optical scanning system, employing efficient successive deflections to enhance scanning capabilities, said system comprising of:

light source for supplying a light beam;

surface to be scanned by the light beam;

rotating mirror for deflecting the light beam;

fixed mirror positioned face to face in front of the rotating mirror, the combination of the fixed mirror and the rotating mirror making a multiple deflection system, implementing successive deflections of the input light beam applied thereto, the input beam enters the multiple deflection system from one tangential side of the mirrors, the fixed mirror folds the deflected light beam from the rotating mirror back to the rotating mirror successively, until the final deflected output beam emerges from the multiple deflection system, from the other tangential side of the mirrors, after a predetermined number of deflections, irrespective of the angular position of the rotating mirror, the light beam remaining fully seated on the rotating mirror and the fixed mirror during each complete scan cycle;

first optical means positioned optically between the light source and the multiple deflection system to configure and direct the light beam from the light source toward the multiple deflection system; and

second optical means positioned optically between the multiple deflection system and the scanned surface to configure and focus the deflected output beam emerging from the multiple deflection system to a scanning circular light spot on the scanned surface;

whereby, a larger scan angle and a higher resolution are obtained with high efficiency, through a smaller rotation of the rotating mirror as compared to a conventional single deflection system.

4,960,313

APPARATUS FOR ROTATING A LIGHT IMAGE AND AN OPTICAL SYSTEM FOR FOCUSING LIGHT BEAMS ON A RECORDING MEDIUM

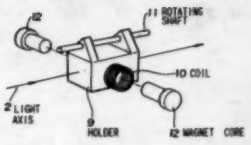
Yutaka Yamanaka, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Jan. 9, 1989, Ser. No. 294,702

Claims priority, application Japan, Jan. 7, 1988, 63-2325; Jun. 28, 1988, 63-158114

Int. Cl.[5] G02B *26/10*

U.S. Cl. 350—6.1 **4 Claims**



1. An apparatus for rotating a light image comprising,

an optical medium having n reflection planes in number where n is an odd number (n = 1, 3, 5 ...), said optical medium receiving an incident light beam parallel to a reference light axis and transmitting an output light beam parallel to said reference light axis, each of said n reflection planes having a normal included in a predetermined plane including said reference light axis, and

means for rotating said optical medium around a line, positioned outside said optical medium to be parallel to said reference light axis, by a predetermined angle based on a rotating angle of a light image.

4,960,314

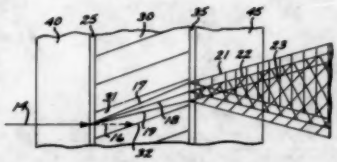
DIFFRACTION OPTICS DIFFUSING SCREEN LAMINATE FOR FULL COLOR ON-AXIS VIEWING

Ronald T. Smith, Redondo Beach, and Ronald G. Hegg, Inglewood, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Jul. 5, 1988, Ser. No. 214,986

Int. Cl.[5] G02B *5/32*

U.S. Cl. 350—3.7 **34 Claims**



1. An optical apparatus comprising:

a transmission holographic optical element comprising means for diffracting a portion of a beam of multi-color light incident on said element to redirect the diffracted light so that it exits from said element at acute angles relative to the remaining portion of the incident beam;

an optical louver filter positioned with respect to said transmission holographic element so that light passing through said element is incident on said louver filter, said filter comprising a plurality of transparent cells separated by opaque louvers, said louvers being cooperatively arranged with respect to the diffracted light from said transmission holographic optical element so that diffracted multi-color light passes unimpeded through said filter and zero-order light is blocked by said louvers; and

a diffraction optics holographic optical diffusion screen

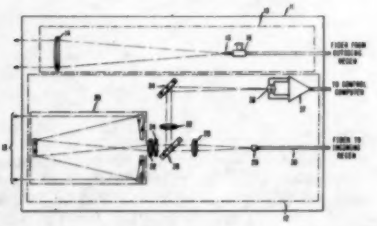
supported adjacent said louver filter and comprising means for diffusively diffracting light exiting said filter toward a predetermined exit pupil so that light diffracted by said optical diffusion screen is substantially directed toward and illuminates said exit pupil.

4,960,315

ATMOSPHRIC OPTICAL COMMUNICATION LINK

Hubert Kostal, Manahawkin; Rodney C. Luhn, Leonardo, and Donald E. Smith, Colts Neck, all of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed May 19, 1989, Ser. No. 354,527
Int. Cl.[5] G02B *6/32*
U.S. Cl. 350—96.18 **6 Claims**



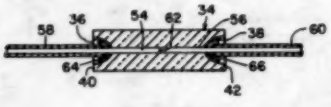
2. An atmospheric optical communication device characterized by an optical regenerator, a first optical fiber having one end coupled to receive optical energy from said optical regenerator, a collimating lens coupled to receive and collimate an expanded beam of optical energy from said optical regenerator which exits the other end of said optical fiber, optical energy collecting means oriented to receive optical energy from said collimating lens, a second optical fiber coupled to receive optical energy from said collimating lens and a graded index lens coupled to an end of said second optical fiber to facilitate the coupling of light into said fiber.

4,960,316

CAPILLARY SPLICE

George E. Berkey, Pine City, N.Y., assignor to Corning Incorporated, Corning, N.Y.

Division of Ser. No. 82,680, Aug. 7, 1987, Pat. No. 4,822,389.
Filed Nov. 14, 1988, Ser. No. 270,613
The portion of the term of this patent subsequent to Feb. 28, 2006, has been disclaimed.
Int. Cl.[5] G02B *5/14*
U.S. Cl. 350—96.21 **7 Claims**



1. An optical fiber splice comprising

a hollow glass cylinder having first and second end surfaces and a bore along the longitudinal axis thereof,

the portion of said hollow cylinder adjacent said first end surface defining a tapered aperture extending inwardly from said first end surface and merging with said bore,

the portion of said hollow cylinder adjacent said second end surface defining a tapered aperture extending inwardly from said second end surface and merging with said bore,

a pair of optical fibers disposed in said longitudinal aperture, the ends of said fibers abutting each other intermediate the ends of said cylinder, each of said fibers comprising a core and cladding, that portion of each of said fibers extending beyond the ends of said cylinder having a protective coating thereon, said coating extending into and terminating within the respective tapered aperture, and

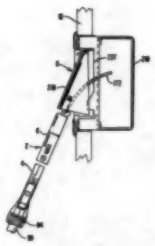
a quantity of adhesive within each of said tapered apertures surrounding each respective fiber including the ends of the coated portions of said fibers that extend within said tapered apertures, whereby each fiber and the end portion of the coating thereof is affixed to said cylinder.

4,960,317

WALL OUTLET FOR A FIBER OPTIC CONNECTOR ASSEMBLY

Robert C. Briggs, Newport; Robert N. Weber, Hummelstown, and John C. Hoffer, Harrisburg, all of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Division of Ser. No. 236,103, Aug. 23, 1988, abandoned. This application Aug. 18, 1989, Ser. No. 395,680
Int. Cl.[5] G02B *6/38*
U.S. Cl. 350—96.21 **20 Claims**



1. A fiber optic wall outlet assembly comprising

an annular flange for mounting to a wall,

hood means mounted in said annular flange, and movable between a closed position wherein said hood means is substantially flush with said wall and an open position wherein said hood means projects away from said wall,

biasing means connected to said hood means and biasing said hood means into said open position,

engagement means on said hood means and cooperating with said flange to releasably engage said hood means into said closed position, and

release means for releasing said engagement means from said flange and for permitting said biasing means to urge said hood means into said open position.

4,960,318

OPTICAL FIBER CABLE

Richard C. Nilsson, Hickory, N.C., and James M. Berry, Roanoke, Va., assignors to Alcatel NA, Inc., Hickory, N.C.

Filed Apr. 25, 1989, Ser. No. 343,013
Int. Cl.[5] G02B *6/44*
U.S. Cl. 350—96.23 **15 Claims**

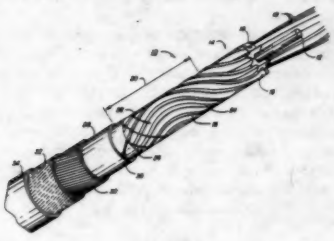
1. An optical fiber cable, comprising:

a central strength member located generally along a longitudinal axis of said cable;

a plurality of optical fibers disposed in a plurality of fiber guides traversing the length of said cable along reversing helical paths surrounding said central strength member;

strength members symmetrically positioned about the cen-

tral strength member and traversing the length of said cable along reversing helical paths located in juxtaposition



with and between selected ones of the paths of the fiber guides; and

a jacketing means for enclosing said cable.

4,960,319

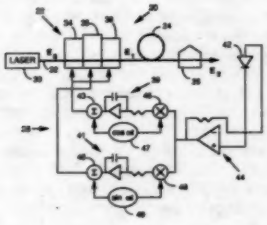
ACTIVE POLARIZATION CONTROL SERVO AND METHOD

John A. Dankowych, Toronto, Canada, assignor to Litton Systems, Inc., Beverly Hills, Calif.

Filed Oct. 4, 1989, Ser. No. 417,182

Int. Cl.[5] G02B *6/02, 6/16, 6/26*

U.S. Cl. 350—96.29 **28 Claims**



1. A system for controlling the polarization of light guided by an optical waveguide, comprising:

means for controlling the birefringence of the optical waveguide comprising a first transducer and a second transducer arranged to act on the optical waveguide along parallel axes and a third transducer being on an axis that is placed between the parallel axes and angularly displaced by 45° therefrom;

means for applying a first control signal to each of the first and second transducers;

means for applying a second control signal to the third transducer, the first and second control signals being in time quadrature;

means for forming and electrical signal indicative of the intensity of light guided by the optical waveguide;

means for processing the electrical signal to form an error signal indicative of differences between the polarization state of light guided by the optical waveguide and a predetermined desired polarization state; and

means for combining the error signal with the first and second control signals to minimize the different between the polarization state of light guided by the optical waveguide and the desired polarization state.

4,960,320

OPTICAL BEAM SPLITTING METHOD AND AN OPTICAL BEAM SPLITTING/MODULATION METHOD

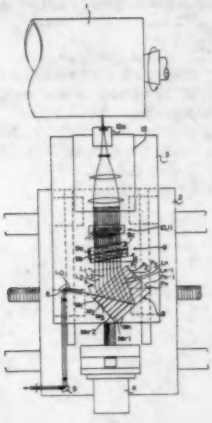
Hiroshi Taniura, Iharagi, Japan, assignor to Think Laboratory Co., Ltd., Chiba, Japan

Filed Dec. 16, 1988, Ser. No. 286,632

Claims priority, application Japan, May 16, 1988, 63-118659

Int. Cl.[5] G02B *27/14;* **G02F** *1/33*

U.S. Cl. 350—171 **2 Claims**



1. An optical beam splitting method characterized in that:

a light beam is caused to pass through a first optical beam splitter in which (a) a prescribed number n of transparent parallel plates whose thicknesses are uniform to a high degree of precision are stacked together, (b) the back surface of the transparent parallel plate which is the farthest from the side at which said light beam enters is coated with a totally reflective film while the back surfaces of all of the remaining transparent parallel plates are coated with different semi-reflective films whose respective reflectivities gradually increase from the front of the stack toward the back in a numerical series 1/n, 1/(n−1), 1/(n−2), 1/(n−3), . . . 1/4, 1/3, 1/2 in relation to the number n of said transparent parallel plates, and (c) coating regions of said totally reflective film and semi-reflective films are positioned in an oblique arrangement which is struck by said light beam traveling obliquely through the interiors of said transparent parallel plates;

said light beam is partially reflected by each of said semi-reflective films and completely reflected by said totally reflective film, so that said light beam is converted into a number n of split light beams which are of equal luminous intensity, and so that the respective split light beams are emitted parallel to each other in a row in the direction of the side of the stack from which the said light beam initially entered, without any of said split light beams striking the preceding semi-reflective films; and

said split light beams are next caused to be incident on an optical beam splitter in which (a) one surface of a light-transmitting material is partially coated in band form with a totally reflective film, while another parallel surface of said light-transmitting material is partially coated in band form with a reflective film which has a reflectivity of 50%, and (b) said surface which is cated with said totally reflective film is inclined two-dimensionally by a prescribed amount with respect to the optical axes of the split light beams split by the first optical beam splitter;

wherein a series of split light beams with approximately 50% of the intensity of the incident light beams are split and emitted parallel to each other in a row from said semi-reflective film and a series of split light beams with the remaining 50% of the intensity of the incident light beams

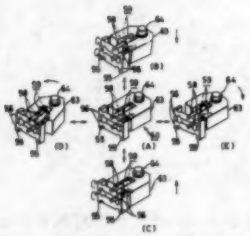
are internally reflected by said semi-reflective film and completely reflected by said totally reflective film, and are therefore again emitted parallel to each other in a row from the surface coated with said semi-reflective film, but are emitted so that they miss said semi-reflective film, and are furthermore emitted so that said split light beams are separated by a prescribed distance from said series of split light beams, and so that the individual split light beams in the series are shifted by approximately one-half pitch with respect to the individual split light beams in the series.

4,960,321

OPTICAL APPARATUS

Naomasa Takahashi, Kawasaki, Japan, assignor to Kabushiki Kaisha Toshiba, Kanagawa, Japan

Filed Nov. 14, 1988, Ser. No. 270,327
Claims priority, application Japan, Nov. 13, 1987, 62-285475
Int. Cl.[5] G02B 7/02
U.S. Cl. 350—255 **12 Claims**



1. An optical apparatus for focusing a light beam, comprising:

means for directing the light beam onto an optical memory; and

means for supporting the directing means, said supporting means including:

an elongated member having two ends;

means for linking one end of the elongated member to the directing means for limited rotation of the directing means about a particular point, the linking means including the particular point; and

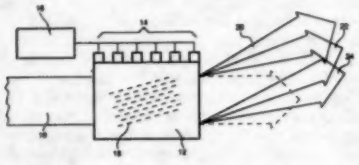
means for flexibly holding the other end of the elongated member with respect to focusing movement of the directing means.

4,960,322

KERR-BRAGG AGILE BEAM STEERING DEVICE

Mohsen Khoshnevisan, Newbury Park, and Pochi A. Yeh, Thousand Oaks, both of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Dec. 23, 1988, Ser. No. 289,632
Int. Cl.[5] G02F 1/11, 5/23
U.S. Cl. 350—354 **13 Claims**



1. An apparatus for steering a coherent input beam of electromagnetic energy, comprising:

an optically nonlinear medium for positioning in the path of the input beam and

a source of acoustic energy for generating acoustic waves in the nonlinear medium with a predetermined frequency and direction,

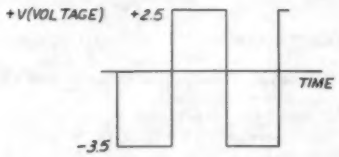
the frequency and direction of the acoustic waves being selected to diffract and frequency downshift a portion of the input beam as an output beam at a predetermined angle with respect to the input beam, interference between the input beam and the output beam initially causing a nonlinear electrostrictive grating to form in the medium, with the grating subsequently causing additional energy to be transferred from the input beam to the output beam by nonlinear optical stimulated Brillouin scattering.

4,960,323

METHOD FOR MAINTAINING THE ELECTROCHROMIC ACTIVITY OF AN ELECTROCHROMIC MATERIAL

Hulya Demiryont, Dearborn, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Oct. 5, 1988, Ser. No. 253,657
Int. Cl.[5] G02F 1/01
U.S. Cl. 350—357 **8 Claims**



1. A method of maintaining the electrochromic activity of a cathodic electrochromic material having a non-stoichiometric composition provided between electrodes of an electrochromic device, which method comprises:

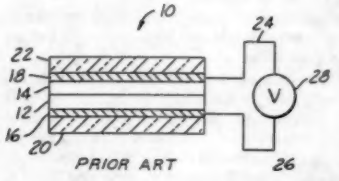
applying a voltage, at least during operation of said device, across said electrodes of such level that the absolute value of an applied negative voltage is greater than the absolute value of an applied positive voltage, so as to continuously maintain a negative charge abundance in said electrochromic material sufficient to keep said electrochromic material in a non-stoichiometric state and whereby oxidation of said electrochromic material is substantially prevented.

4,960,324

ELECTROCHROMIC, OXYGEN DEFICIENT METAL OXIDE FILMS PROVIDED BY PYROLYTIC DEPOSITION

Franklin I. Brown, Southfield, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Oct. 5, 1988, Ser. No. 253,656
Int. Cl.[5] G02F 1/01
U.S. Cl. 350—357 **30 Claims**



1. An electrochromic device comprising two substrates and therebetween one electrode layer, an electrochromic layer, an

ion conductive layer, and another electrode layer in that order, at least one of said one electrode layer and said other electrode layer being transparent and each electrode layer being in contact with one of said substrates, said ion conductive layer comprising ion source means for providing ions into said electrochromic layer upon application of a voltage across said electrode layers, wherein said electrochromic layer comprises a non-stoichiometric, oxygen deficient, variable oxidation state metal oxide deposited by pyrolytic deposition onto a surface selected from a surface of said ion conductive layer and a surface of said electrode layer while said surface is at a temperature between 500° F. and 1200° F. and said metal oxide composition is deposited by pyrolytic deposition of a composition which is selected from a powdered composition comprising a variable oxidation state metal compound and a reducing agent or a liquid composition comprising a variable oxidation state metal compound and a reducing agent.

4,960,325

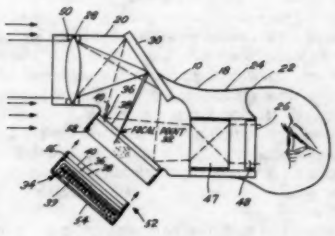
LIGHT PROTECTION APPARATUS AND PROTECTIVE ELEMENT SUBASSEMBLY THEREFOR

Frank A. Witt, III, 918 Pond Dr., West Columbia, S.C. 29169

Filed Jun. 22, 1988, Ser. No. 209,848

Int. Cl.[5] G02F *1/01*

U.S. Cl. 350—363 **4 Claims**



1. A light protection apparatus for receiving a beam of light having a harmless component and a harmful component, the apparatus comprising:

a light protection housing having a front forward end and a rear viewing end;

a view aperture located at said viewing end;

an eye piece lens means mounted at said viewing end relative to said view aperture;

objective lens means mounted at said forward end for receiving and directing said beam of light into said housing;

a reflective means mounted in said housing for reflecting said beam of light upon its passing through said objective lens means;

a protective element subassembly having an absorbing portion and a reflective pellicle surface, said protective element subassembly being mounted in said housing so that the reflective pellicle surface interposes the absorbing portion and the reflective means, the reflective pellicle surface being constructed and arranged relative to said reflective means (i) to reflect the harmless component of the beam of light to said eyepiece lens means and (ii) to be destroyed at the point where said pellicle surface is contacted by the harmful component of the beam of light for passing the harmful component to said absorbing portion and preventing the reflection of the harmful component to said eyepiece lens means, said protective element subassembly including removal means cooperating with said housing for permitting the removal of said subassembly from said housing;

said eyepiece lens means for refocusing the harmless component of the light beam for viewing in a substantially undistorted form.

4,960,326

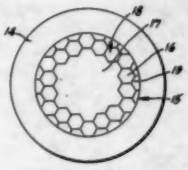
LENTICULAR EYEWEAR AND METHOD OF FABRICATION

Hector A. Dauvergne, 419 E. Merle, San Leandro, Calif. 94577

Filed Mar. 6, 1989, Ser. No. 318,956

Int. Cl.[5] G02C *13/00*

U.S. Cl. 351—41 **6 Claims**



1. A molded lenticular lens for use in eyeglasses having a styled frame comprising:

a thin lens blank having a first surface with a continuous optical curvature and a second surface which optically coacts with the first surface, the second surface having an outer perimeter portion without optical correction, a middle portion having a plurality of hexagonally configured lenticles forming a patterned lenticular complex, each lenticule having an optical correction, and said second surface further including a center portion having an optical correction, the lenticular complex being arranged around the center portion, said plurality of hexagonally configured lenticules forming an irregular border around said center portion of said second surface.

4,960,327

OPTICAL SYSTEM IN A LASAR SCANNING EYE FUNDUS CAMERA

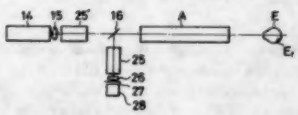
Ahihiko Sekine, Tokyo, Japan, assignor to Kabushiki Kaisha Topcon, Tokyo, Japan

Filed Jun. 27, 1988, Ser. No. 212,388

Claims priority, application Japan, Jul. 15, 1987, 62-176760; May 9, 1988, 63-112070

Int. Cl.[5] A61B *3/10*

U.S. Cl. 351—221 **1 Claim**



1. An optical system in a laser scanning eye fundus camera comprising:

an illuminating optical system for illuminating an eye fundus through an eye pupil by scanning the eye fundus with an illuminating laser light from a laser light source by means of an optical scanning device;

a light receiving optical system for conducting the reflected light reflected from the eye fundus to a light receiver unit, in which said light receiving optical system and said illuminating optical system have a common optical scanning device, said light receiving optical system including a display device for displaying an image of the eye fundus in response to a signal from said light receiver unit, said display device including magnification adjusting means for changing the magnification of the image of the eye fundus on said display device; and

beam diameter adjusting means provided in said illuminating optical system conjugate with the intended position of the pupil for adjusting the beam diameter of the laser beam

projected onto said eye fundus, in which said beam diameter adjusting means is placed between the laser light source and the optical scanning device, in which the reflected light from the eye fundus is directed to the light receiver unit through a beam splitter placed between said beam diameter adjusting means and said optical scanning device, and in which second beam diameter adjusting means, separate from said beam diameter adjusting means, is provided between the beam splitter and the light receiver unit, whereby an operator may separately adjust the diameter of the laser light projected onto the eye fundus and the diameter of the reflected light beam from the eye fundus.

4,960,328

APPARATUS FOR THE EXTRUSION, EXPANSION AND/OR THERMAL TREATMENT OF SUBSTANCES AND SUBSTANCE MIXTURES

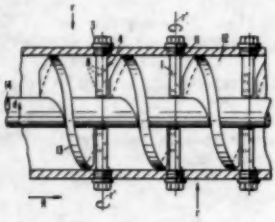
Heinz O. Schumacher, deceased, late of Hamburg, and by Walter H. Schumacher, executor, Höperfeld 26, 2050 Hamburg 80, both of Fed. Rep. of Germany

Filed Aug. 19, 1988, Ser. No. 234,041

Claims priority, application European Pat. Off., Aug. 21, 1987, 87112120.8

Int. Cl.[5] B01F *7/08*; B29B *7/42*

U.S. Cl. 366—80 **10 Claims**



1. In an apparatus for extruding, expanding and/or thermally treating substance mixtures, wherein the material or the mixture to be treated is continuously advanced in a closed system equipped with a feeding screw from an inlet of the system to an outlet and in the course thereof is treated under given process conditions such as contact time, pressure, temperature, reaction components, additives, and the like, wherein for carrying out reactions, conversions or even only comingling there are provided lead-in means for fluids, and wherein scraper fingers are present which break up the material or the mixture in the course of its passage through the system and for this purpose extend from attachment on a jacket of the apparatus up to the vicinity of a rotary shaft of the screw, the improvement comprising:

each scraper finger having a pin body defining a longitudinal axis and including a recess extending in a direction toward the rotary shaft up to an end face of the pin body in the vicinity of the rotary shaft and at least one center bore and side bores issuing from said center bore, said pin body being asymmetrical with respect to the longitudinal axis; and

means for mounting said scraper fingers in a casing of the apparatus for rotation from outside the apparatus around their axes during running operation of the apparatus.

4,960,329

CHIRP PULSE ECHO RANGING APPARATUS

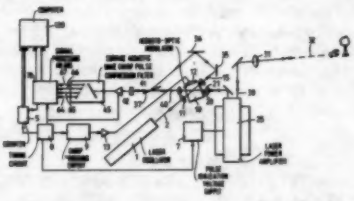
John M. S. Schofield, Redhill, Great Britain, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 15, 1988, Ser. No. 232,400

Claims priority, application United Kingdom, Aug. 14, 1987, 8719269

Int. Cl.[5] G01C *3/08*; G01P *3/36*

U.S. Cl. 356—5 **28 Claims**



1. A chirp pulse echo ranging apparatus comprising transmitting means for emitting pulses of wave energy, each having a frequency which varied linearly during the pulse duration, receiving means for receiving echo signals resulting from reflection of the emitted wave energy from an object, frequency compression means coupled to the receiving means and having a frequency dispersion characteristic for effecting substantially simultaneous production of components of the received echo signals associated with different predetermined frequencies, thereby forming compressed echo pulses, and timing means for determining a time delay between the occurrence of each compressed echo pulse and a timing reference pulse having a predetermined relationship to a time at which a respective pulse of wave energy was transmitted, characterized in that:

a. the frequency compression means includes a plurality of outputs at which ones of said components in different frequency bands are produced; and

b. the apparatus includes processing means coupled to said outputs for determining from relative magnitudes of said components a line of sight velocity of the object relative to the apparatus.

4,960,330

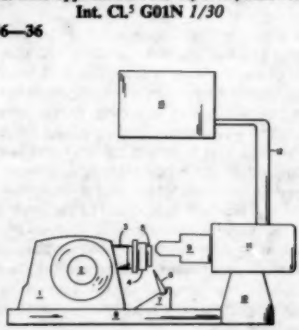
IMAGE RECORDING APPARATUS

Russell L. Kerschmann, 3 Concord Ave. #32, Cambridge, Mass. 02138

Continuation-in-part of Ser. No. 755,429, Jul. 16, 1985, abandoned. This application Jul. 11, 1988, Ser. No. 217,669

Int. Cl.[5] G01N *1/30*

U.S. Cl. 356—36 **7 claims**



1. An imagre recording method comprising

infiltrating an object with and embedding said object in material containing a UV absorber which maximally absorbs at a wavelength near the maximum absorbance wavelength of a first fluorescent dye,

staining said object with said first fluorescent dye, said dye being characterized by a maximum of absorbance wavelength and a minimum absorbance wavelength,

embedding said object in a block capable of being cut with a knife,

cutting a plurality of slices from said block using said knife to form successfully deeper images of said faces on said block,

receiving, by means of a microscope or scanning laser, successively deeper images of the face of said block,

recording said successively deeper images of said faces on said block, and

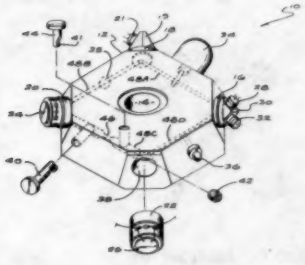
storing said recorded images in a computer.

4,960,331

FARADAY ROTATOR ASSEMBLY

Robert P. Goldman, Woodland Hills, and John G. Larson, Tarzana, both of Calif., assignors to Litton Systems, Inc., Beverly Hills, Calif.

Filed Dec. 2, 1988, Ser. No. 279,354
Int. Cl.[5] G01C *19/64*
U.S. Cl. 356—350 **12 Claims**



1. In a multi-mode ring laser gyroscope, including a monolithic frame having a closed cavity therethrough, said cavity defining an out-of-plane configured closed optical pathway formed between each two of a plurality of mirrors affixed to said frame, said ring laser gyroscope comprising:

transverse mode suppression means associated with said frame;

said transverse mode suppression means being insertably positioned into a transverse hole, along said frame, which intersects said optical pathway; and,

said transverse mode suppression means being optically contacted with said frame for securement of said transverse mode suppression means within said ring laser gyroscope;

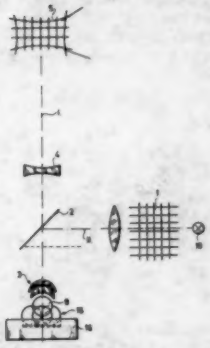
whereby, said transverse mode suppression means may be fabricated external to said frame and inserted therein, avoiding contamination or degradation of said gyroscope or said transverse mode suppression means which would adversely affect ring laser gyroscope performance.

4,960,332

APPARATUS FOR GEOMETRICAL TESTING OF SPHERICAL BODIES, IN PARTICULAR STEEL BALLS

Tivadar Földi; István Bernát, both of Budapest, and László Vogronics, Érd, all of Hungary, assignors to Vertikum Magas- és Mélyépitményjavito Kiszovetkezet, Budapest, Hungary

Filed Jun. 30, 1988, Ser. No. 214,481
Claims priority, application Hungary, Jul. 6, 1987, 3033/87
Int. Cl.[5] G01B *11/30*
U.S. Cl. 356—376 **5 Claims**



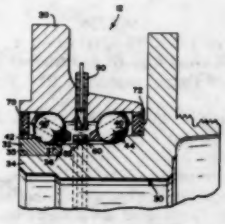
1. An apparatus for the testing of spheres for geometric exactness, which comprises a light source, a projectable image within or outside of said light source, optical means for simultaneously directing light in two different directions wherein one of said directions is onto a sphere to be tested and the other of said directions is onto an imaging means, and means for directing light onto said imaging means either as reflected from the sphere to be tested, or both from the sphere and from the light source without the optical interposition of the sphere.

4,960,333

ANTIFRICTION BEARING ASSEMBLY SPEED SENSOR

Bradley D. Faye, Goshen; James A. Hilby, Watertown, both of Conn.; Denis Aiff, and Christian Hajzler, both of Annecy, France, assignors to The Torrington Company, Torrington, Conn.

Filed Oct. 16, 1989, Ser. No. 422,218
Int. Cl.[5] F16C *33/30*; G01P *3/48*
U.S. Cl. 384—448 **3 Claims**



1. An antifriction bearing assembly mounted on a rotatable shaft, said bearing assembly comprising in combination:

an outer race which is stationary relative to said shaft,

said outer race having an inner surface and an outer surface;

an inner race which is rotatable relative to said outer race, said inner race being attached to said shaft;

two annular rows of rolling elements between said inner and outer races;

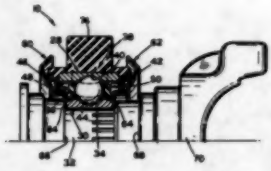
a resilient O-ring press-fit around said inner race between said two rows of rolling elements;
an encoder mounted on said O-ring;
a sensor assembly having a sensor aligned with said encoder to provide an output signal proportional to the rotational speed of said shaft; and
means for mounting said sensor assembly in said outer race.

4,960,334

SUPPORT FOR ROTATABLY SUPPORTING A SHAFT

Philip J. Mazziotti, Toledo, Ohio, assignor to The Zeller Corporation, Defiance, Ohio

Filed Mar. 2, 1989, Ser. No. 318,017
Int. Cl.[5] F16C *33/76, 27/06, 33/38*
U.S. Cl. 384—486 25 Claims



1. A low-cost, simplified rolling contact support for use with a shaft support for supporting a portion of a shaft, said rolling contact support having an inner race to be mounted on the shaft, said race having an outwardly-facing annular groove at an intermediate portion of an outer surface thereof, said outer surface being arcuate shape as viewed in transverse cross section, an outer race having an inwardly-facing annular groove at an intermediate portion of an inner surface thereof, a plurality of rolling elements extending into said grooves, a combination cage and lubricant sealing element comprising two symmetrical spacing and sealing rings, one on each side of said rolling elements, each of said rings having a plurality of uniformly-circumferentially spaced recesses in which portions of said rolling elements are received, there being a number of recesses in each of said rings equal to the number of rolling elements, each of said rings having a first annular sealing lip contacting the arcuate outer surface of said inner race outside of said outwardly-facing groove, each of said rings having a second annular sealing lip contacting the inner surface of said outer race outside of said inwardly-facing groove, each of said rings having an additional annular sealing lip contacting the outer surface of said inner race outside of said first annular sealing lip, and resilient means extending around and supporting said outer race.

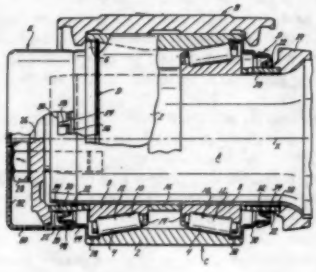
4,960,335

UNITARY ENCLOSURE AND COVER THEREFOR

Dennis L. Otto, Carroll County, and Richard O. Dimit, Stark County, both of Ohio, assignors to The Timken Company, Canton, Ohio

Filed Nov. 13, 1989, Ser. No. 434,820
Int. Cl.[5] F16C *33/78*
U.S. Cl. 384—484 20 Claims

1. In combination with an outer body and an inner body that is located within the outer body such that an annular space exists between the two bodies, one of the bodies being rotatable with respect to the other body about an axis of rotation and the inner body having an annular sealing surface that is presented away from the axes of rotation; an improved enclosure for establishing a barrier between the outer and inner bodies and thereby enclosing the annular space between the two bodies, said enclosure being formed essentially as an integral unit from a polymer and comprising: a case attached to the outer body such that a static seal exists between the case and outer body, a primary lip carried by the case and encircling the sealing surface, but being spaced from the sealing surface so that a slight clearance exists between the sealing surface and the primary lip, the primary lip having cavities which open toward



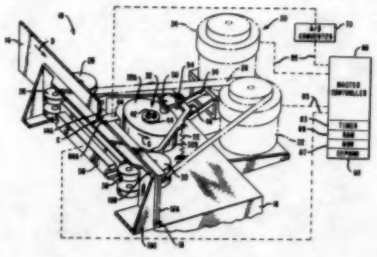
the sealing surface and toward the annular space and are configured to direct lubricant which they encounter back toward the annular space.

4,960,336

APPARATUS AND METHOD FOR CALIBRATING PRINTING AT A SPECIFIED DISTANCE FROM A DOCUMENT EDGE

Ralf M. Brooks, Waterloo; Fredrik L. N. Kallin, Kitchener; Gary R. Marshall, Alma, and Bruce A. Reid, Elmira, all of Canada, assignors to NCR Corporation, Dayton, Ohio

Filed Jan. 26, 1990, Ser. No. 470,452
Int. Cl.[5] B41J *5/30, 3/20*
U.S. Cl. 400—61 21 Claims



1. A method for calibrating a printer at a print station to print data in a character field beginning at a specified distance from the reference edge of a document moving through said print station; said method comprising the steps of:
(a) positioning a test document at the print station;
(b) printing a test symbol on said test document with a print member having a plurality of heating elements, said test symbol having a midpoint which is printed by a preselected heating element;
(c) sensing the test symbol distance between said reference edge and the midpoint of said test symbol with a sensor;
(d) repeating step (a) through step (c) at least one time;
(e) calculating an average test symbol distance by averaging the test symbol distances determined in steps (c) and (d);
(f) determining the actual distance between the preselected heating element and said reference edge;
(g) determining the relative location between said sensor and each said heating element of said print member;
(h) determining a calibration distance which is the difference between said actual distance determined in step (f) and said average test symbol distance; and
(i) calibrating said printer to account for said calibration

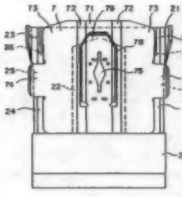
distance so that the leading edge of the first character of data to be printed is printed on each document at said specified distance from the reference edge of said document when said document is moved through the print station.

4,960,337

RIBBON MASK FOR A PRINTER

Toshikiyo Kato; Yasuo Ichikawa; Wataru Ito; Hiroshi Ikeda, and Yoshio Kamata, all of Tanashi, Japan, assignors to Citizen Watch Co., Ltd., Tokyo, Japan

Filed Feb. 10, 1989, Ser. No. 308,796
Claims priority, application Japan, Feb. 13, 1988, 63-17975[U]
Int. Cl.[5] B41J *35/06, 35/26*
U.S. Cl. 400—248 **3 Claims**



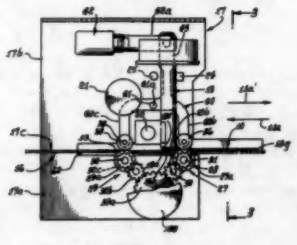
1. A ribbon mask for a printer having a platen, a carriage provided to be reciprocated in parallel with a longitudinal axis of the platen, a vertical supporting member secured to the carriage and a print head mounted on the carriage, said ribbon mask comprising a resilient plate attached to said supporting member, said resilient plate having defined therein, by an inverted U-shaped slit, a cantilevered resilient member of said resilient plate so as to extend in a vertical direction, said resilient plate being arranged so as to abut a front end of said print head to form a path for a ribbon between said resilient plate and said print head.

4,960,338

DUAL PRINTER SYSTEM

Dunstan P. Sheldon, 1752 E. Altadena Dr., Altadena, Calif. 91001

Continuation-in-part of Ser. No. 32,535, Apr. 1, 1987, Pat. No. 4,744,681. This application May 2, 1988, Ser. No. 189,121
The portion of the term of this patent subsequent to May 17, 2005, has been disclaimed.
Int. Cl.[5] B41J *13/02*
U.S. Cl. 400—636.1 **11 Claims**



1. In a printing system, including a source of A data and B data to be printed, the combination comprising

(x_1) first printer means operatively connected with said source of A and B data to receive the A data for printing on a first sheet and to pass the B data, and

(x_2) second printer means operatively connected with said source of A and B data, via the first printer means, to receive the B data passed thereby, and to print the B data on a second sheet,

(x_3) first said printer means comprising:

(a) a feed plate adjacent which said first sheet is fed in a longitudinal feed direction,

(b) a print head for printing A data on the first sheet,

(c) first drive means at one longitudinal side of the print head, and second drive means at the opposite longitudinal side of the print head, said drive means operable to move the first sheet longitudinally forwardly and then longitudinally reversely to enable the print head to print on relatively spaced zones on the first sheet,

(d) the first drive means including first drive roller means, and the second drive means includes second drive roller means, there being drive means to drive said roller means in one mode to feed the sheet longitudinally forwardly and then in a second mode to feed the sheet longitudinally reversely to enable the print head to print on spaced zones on the sheet,

(e) the first printer means also including:

(i) first pinch roller means located to urge the first sheet against the first drive roller means, and second pinch roller means located to urge the first sheet against the second drive roller means, and actuator means to selectively urge the first and second pinch roller means relatively toward the first and second drive roller means, respectively,

(ii) a first sensor positioned to sense the edge of the first sheet that has passed longitudinally forwardly between the first drive roller means and first pinch roller means, and operatively connected with the actuator means to cause the actuator means to urge the first pinch roller means toward the first drive roller means to pinch the first sheet therebetween, whereby the first drive roller means then drives the first sheet longitudinally forwardly,

(f) the first roller means comprising laterally spaced apart rollers, and the second drive roller means also comprising laterally spaced apart rollers,

(g) the drive means for the drive roller means comprising a stepper motor operable to alternately travel the first sheet forwardly or reversely during travel intervals and to arrest first sheet advancement during arrest intervals, to enable printing on the first sheet by the print head during the arrest intervals, the stepper motor connected to both first and second drive roller means,

(h) there being a second sensor positioned to sense said edge of the first sheet that has passed beyond the second drive roller means and second pinch roller means, and operatively connected with said actuator means to cause the actuator means to urge the second pinch roller means toward the second drive roller means to pinch the first sheet therebetween whereby the second drive roller means then drives the first sheet further longitudinally forwardly, thereby to bring a rear section of the first sheet into registration with the print head,

(i) and a third sensor positioned to sense said edge of the first sheet that has passed further beyond the second drive roller means and second pitch roller means, and to a point corresponding to said registration of the rear section of the first sheet with the print head, and operatively connected with said drive means for causing the drive means to drive the roller means in said second mode,

(j) the first printer means comprising an envelope printer, and said second printer means comprising a letter printer, and including an envelope on the feed plate and under the print head.

4,960,339

MAKEUP LIQUID CONTAINER WITH APPLICATOR

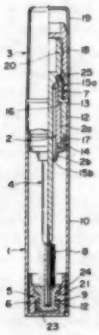
Shigeo Iizuka; Takao Kishi; Riichi Ogawa, and Hiroshi Mizushima, all of Tokyo, Japan, assignors to Yoshino Kogyosho Co., Ltd., Japan

Filed Dec. 13, 1988, Ser. No. 283,972

Claims priority, application Japan, Jul. 13, 1988, 63-92877[U]; Jul. 15, 1988, 63-93780[U]; Jul. 18, 1988, 63-94782[U]

Int. Cl.[5] A45D *34/00*

U.S. Cl. 401—129 **6 Claims**



1. A makeup liquid container with an applicator comprising:
a container body with an open neck;
a cap capable of being fitted to said open neck;
an applicator shaft secured at its one end to said cap and extended downward into said container body when said cap is fitted on said open neck;
an applicator fixed to the other end of said applicator shaft;
a slider received in said container body and slidable along the inner surface of said container body; and
actuating means for causing said slider to move up and down in said container body, said actuating means including:
engaging means for attaining disengageable engagement between said applicator shaft or said applicator and said slider in such a manner that, when said applicator shaft or said applicator is moved into said container body as a result of fitting of said cap on said open neck, said applicator shaft or said applicator presses said slider downward towards the bottom of said container body, whereas, when said applicator shaft or said applicator is moved upward as a result of removal of said cap, said applicator shaft or said applicator catches and lifts said slider so as to cause said slider to move upward, said engaging means being capable of disengaging said applicator shaft or said applicator and said slider from each other when said slider has reached the upper end of its stroke.

4,960,340

IMPLEMENT FOR APPLYING LIQUID

Fumiyuki Tamiya, Hashimoto; Nobuaki Kobayashi, Ikoma, and Mitsuhiro Fukuoka, Osaka, all of Japan, assignors to Kabushiki Kaisha SAKURAKUREPASU, Osaka, Japan

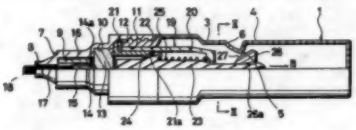
Filed Jan. 13, 1988, Ser. No. 143,915

Claims priority, application Japan, Jan. 23, 1987, 62-9104[U]; Jan. 25, 1987, 62-8824[U]; Apr. 10, 1937, 62-5199[U]; Apr. 10, 1987, 62-55200[U]

Int. Cl.[5] A46B *11/00*

U.S. Cl. 401—186 **8 Claims**

1. An implement for applying liquid to a surface comprising a container means containing a liquid, a liquid applicator means for applying said liquid to said surface, a valve housing means disposed between said container means and said applicator means, a valve control means disposed in said valve housing for controlling the flow of said liquid from said container means to said applicator means, actuator means on said container means, said valve control means having an actuatable part juxtaposed to said actuator means such that said actuator means is operable to actuate said actuatable part to thereby control the flow of liquid from said container means to said applicator means, said applicator means having a cavity and an end passage leading from said cavity, compressible liquid absorbing means in said cavity, said applicator means further comprising a sliding means having an outer end which is



adapted to engage said surface on which the liquid is to be applied and an inner end engageable with said absorbing means, said sliding means being slidably mounted in said end passage for sliding movement between an extended position and a retracted position, said sliding means being slid from said extended to said retracted position to cause said inner end to compress said absorbing means such that the liquid flows from said absorbing means through said end passage to said outer end of said sliding means.

4,960,341

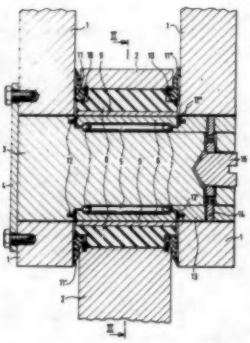
ARTICULATION JOINT

Arne Aarre, and Knut S. Oaland, Sandnes, both of Norway, assignors to A/S Bolt, Sandnes, Norway

Filed Sep. 26, 1989, Ser. No. 412,934

Int. Cl.[5] F16B *1/00*; F16D *1/00*

U.S. Cl. 403—24 **9 Claims**



1. An articulation joint for an articulated boom assembly of the type used on construction machinery such as power cranes, power shovels, back hoes, etc., comprising:
a supporting boom fork, on the boom assembly, having a first transverse bore formed through fork portions on said boom fork;
a tool arm positionabie between said fork portions so that a second transverse bore formed through said tool arm is axially aligned with said first transverse bore;
an articulation pin insertable into said first and second bores to join rotatably said boom fork and said tool arm, said pin having a first outer portion and a second outer portion with a reduced diameter when compared to said first outer portion;
a bearing means positioned between said second outer portion and said tool arm to support rotatably said articula-

tion pin within said tool arm, said means comprising roller bearings positioned about said articulation pin, ball bearings positioned at end portions of said roller bearings, and an outer race positioned about said roller bearings and ball bearings to hold said roller bearings and said ball bearings against said second outer portion, and hold said roller bearings and said ball bearings against each other, so that an outermost surface of said outer race is essentially flush with said first outer portion;

retaining means, connected to said boom fork, to hold one end portion of said articulation pin within said first and second bores;

an access ring adjacent an other end portion of said articulation pin; and

locking means, engageable with said boom fork, said access ring and said articulation pin to prevent the axial movement of said access ring and hold said articulation pin within said first and second bores.

4,960,342

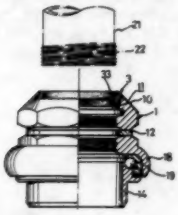
COUPLING FOR SECURING A HANDLEBAR TO A BICYCLE FRAME

Yi-Chen Chi, No. 139-5, An Mei Rd., Mei Shan Tsun; Hou Li Hsian, Taichung Hsien, Taiwan

Filed Mar. 15, 1990, Ser. No. 493,760

Int. Cl.[5] F16B 1/00

U.S. Cl. 403—24 **3 Claims**



1. A coupling for securing a handlebar to a bicycle frame that carries a compression nut through which a handlebar standpipe is received, characterized in that said compression nut has an inner thread formed in an upper end thereof and a sealing ring is fitted to said upper end of said compression so as to seal against said received standpipe, said sealing ring also has an outer thread formed on a lower end thereof, said outer thread of said sealing ring is threadedly engaged with said inner thread of said compression nut so as to secure said sealing ring in place.

4,960,343

CONNECTOR FOR CONNECTING HOLLOW RECTANGULAR TUBULAR MEMBERS

Frederick W. Reilly, Toronto, Canada, assignor to Miranda Investments Limited, Islington, Canada

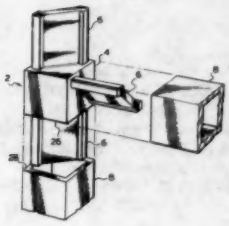
Filed Mar. 2, 1989, Ser. No. 317,907

Claims priority, application Canada, Feb. 17, 1989, 591358

Int. Cl.[5] F16B 7/00

U.S. Cl. 403—171 **10 Claims**

1. A connector for connecting hollow tubular members comprising a cube-shaped base member having a plurality of diagonally extending spigots, each spigot projecting outwardly from a different face of said cube-shaped base member to a free end, and each spigot extending from immediately inwardly of a corner of said base member diagonally straight across the respective face from which it extends to immediately inwardly of the opposite corner of said face, the diagonal taken across each spigot at the free end being marginally less than the diagonal across each respective opening in each tubular member and the diagonal taken across each spigot increasing immediately inwardly of the free end to a diagonal marginally greater than the diagonal taken across each respective opening in each tubular member such than when a spigot is inserted completely



into the tubular member such that the tubular member is contiguous with the face of the base member, the spigot engages the inner wall of the tubular member to make a press fit therein.

4,960,344

LOCKING MECHANISM FOR FIXING AN OUTER PART ON AN INNER PART

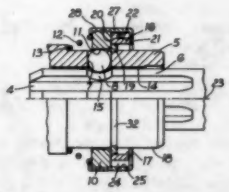
Hubert Geisthoff, and Klaus Kämpf, both of Lohmar, Fed. Rep. of Germany, assignors to Jean Walterscheid GmbH

Filed May 17, 1989, Ser. No. 353,350

Claims priority, application Fed. Rep. of Germany, Jun. 3, 1988, 3818808

Int. Cl.[5] F16B 7/00

U.S. Cl. 403—316 **13 Claims**



1. A locking mechanism for fixing a coupling sleeve of a drive shaft of an agricultural implement to a power take-off shaft of a tractor, the locking mechanism comprising locking members which are guided in apertures in the sleeve so as to be movable in a radially limited way and which, in a locking position, are supported in a radially outward direction on an inner bore face of a movable locking ring of the locking mechanism, which locking ring is loaded by the force of a spring of the locking mechanism into the locking position, the spring acting on the one hand on the sleeve and on the other hand on the locking ring, the locking members extending radially inward from the apertures into a receiving bore of the sleeve and projecting, for fixing purposes, into a recess in the shaft, and the locking mechanism also comprising means for retaining the locking ring in an open position clear of the apertures for the locking members and for automatically cancelling the retention when the shaft is introduced into the receiving bore of the sleeve, wherein the retaining means is in the form of a control ring, the control ring being movable from the locking position of the locking mechanism, with the control ring being guided over a stop projecting radially from the outer face of the sleeve and axially supporting the locking ring, into the retaining position in which the locking ring is axially supported on the one end of the control ring whose other end is supported on the stop, the control ring having a circular cross-section and surrounding the sleeve with play, and being movable from the locking position in which the stop holds the control ring concentrically relative to the locking ring and the sleeve, into an

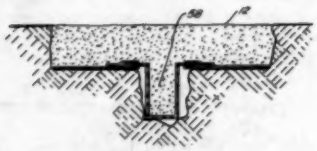
eccentric position relative thereto by an adjusting spring acting on it radially.

4,960,345

SYSTEM FOR CONSTRUCTION OF GOLF COURSE SAND BUNKERS

Dennis Hurley, Marrero; Roy Anderson, Metairie, both of La., and Ken Gorzycki, Boerne, Tex., assignors to Turf Drain Company of America, Inc., Marrero, La.

Filed Jan. 27, 1989, Ser. No. 302,589
Int. Cl.[5] E02B *11/00, 13/00*
U.S. Cl. 405—38 **13 Claims**



7. An improved sand trap, comprising:

(a) a trap hollow, formed into the soil, defined by a continuous vertical side wall, and a substantially horizontally floor portion;

(b) an impermeable material laid at least across the entire floor poriton of the hollow;

(c) a composite drainage line ditch formed of a rigid internal flow member, covered by a geotextile fabric, for allowing water to flow into the drain line at substantially all points along the drainage line, the drainage line positioned upon the layer of impermeable material, out of contact with the floor portion of the hollow; and

(d) sand adhered against the impermeable material laid at least across the entire floor portion of the hollow and additional sand placed to a depth so that the upper face of the sand is substantially the depth of the vertical wall of the hollow.

4,960,346

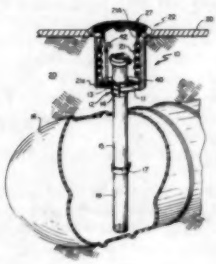
CONTAINMENT UNIT WITH PLUG

Juan H. Tamayo, Miami, Fla., assignor to Pemco, Inc., West Hollywood, Fla.

Filed Oct. 25, 1988, Ser. No. 262,444
Int. Cl.[5] B65G *5/00;* **B65B** *3/06*
U.S. Cl. 405—52 **11 Claims**

1. A containment unit for use with the fill pipe of an underground fuel storage tank wherein said containment unit comprises:

base means including central coupling means for connection to said fill pipe; an upwardly extending nipple projecting from said coupling means; flexible wall means having an upper and lower end with said lower end attached to the periphery of said base means; said upper end of said flexible wall means fixedly attached to annular rim means; outer wall means securely attached to said annular rim means radially outward of the connection of the upper end of said flexible wall means to said annular rim means; flow control means operably connected to the uppermost end of said nipple; cover means removably recieved in said annular rim means and a removable inspection plug sealingly disposed through said base means, said removable inspection plug permitting access to the soil beneath said



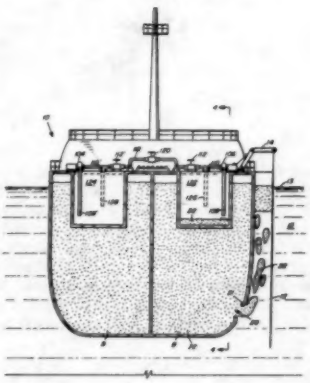
containment unit in the vicinity of said underground fuel storage tank to determine if leaks and soil contamination has occurred.

4,960,347

SHIP-BORNE EMERGENCY OIL CONTAINMENT SYSTEM AND METHOD

Booth B. Strange, 11106 Wickway, Houston, Tex. 77042

Continuation-in-part of Ser. No. 387,520, Jul. 31, 1989. This application Feb. 13, 1990, Ser. No. 479,259
Int. Cl.[5] E02B *15/04*
U.S. Cl. 405—63 **4 Claims**



1. In a tanker ship immersed to its water line in water, said ship having a hull that includes a plurality of liquid cargo tanks, each tank being equipped with an access port, a method for minimizing water pollution from any one of said plurality of tanks carrying a liquid cargo that has suffered a rupture, comprising:

providing at least one pump on said ship dedicated solely to emergency use, said pump being fluidly coupled to a suction intake;

inserting said suction intake through the access port of said ruptured tank;

locating the suction intake inside the ruptured tank, but just below the water line as measured externally of the ship; and

forming a water seal in the ruptured tank by water-flooding the ruptured tank to at least a level above the topmost edge of the rupture by transferring liquid cargo through

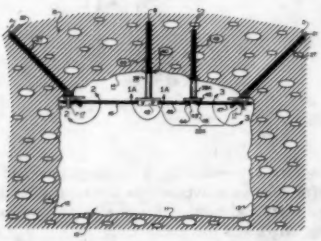
said suction intake by said pump from the ruptured tank into an emergency temporary-holding container.

4,960,348

TRUSS SYSTEMS, COMPONENTS AND METHODS FOR TRUSSING ARCHED MINE ROOFS

Ben L. Seegmiller, 3500 Loren Von Dr., Salt Lake City, Utah 84124

Filed Dec. 8, 1988, Ser. No. 281,467
Int. Cl.[5] E21D *20/00*
U.S. Cl. 405—259 **16 Claims**



1. A method for actively trussing an upwardly concave, arched mine roof having roof rock thereabove, including the steps of: providing a pair of mutually spaced end brackets each having an outwardly and angularly extending hollow tubular insert and also a reaction surface provided at least one tie rod receiving aperture; drilling outwardly-angulated side-opposite apertures in said roof rock proximate transverse terminal regions of said arched roof; anchoring, by a respective anchor bolt passing through said tubular insert, said tubular insert of each of said end brackets in respective ones of said apertures such that said reaction surfaces of said end brackets are essentially parallel; providing a metallic, vertically-elongated vertical post bracket having at least one tie rod securement portion provided with tie rod receiving apertures; compressively securing and anchoring, by a separate anchor bolt passing through said post bracket, said post bracket against said roof rock proximate a central portion of said arched roof between said end brackets; providing tie rods protruding through and extending between said tie rod securement portion of said post bracket and said reaction surfaces of said end brackets at said apertures thereof; providing abutments and also tensioning means, for tensioning said tie rods, to said tie rods at opposite extremities thereof; and actuating said tensioning means whereby to anchor and tension said tie rods between said end brackets and said post bracket, said end brackets being in a horizontal plane, said securement portion of said post bracket being beneath the space between said plane and said arched roof.

4,960,349

WOVEN GEOTEXTILE GRID

Gary L. Willibey, Dunwoody; John W. Hawkins, Stone Mountain; Russell P. Harp, Lithia Springs, and David M. Wilkinson, Stone Mountain, all of Ga., assignors to Nicolon Corporation, Norcross and Georgia Duck and Cordage Mill, Scottdale, both of, Ga.

Division of Ser. No. 280,123, Dec. 5, 1988. This application Jul. 31, 1989, Ser. No. 387,653
Int. Cl.[5] E02D *29/02*
U.S. Cl. 405—262 **6 Claims**

1. A method of reinforcing earth, comprising the steps of:
(a) providing a woven grid, comprising:
(i) a plurality of spaced-apart bundles of pick yarns positioned adjacent to one another and forming a first and a second side of the grid;
(ii) a plurality of pairs of locking yarns oriented parallel to the pick yarns, each yarn in a locking yarn pair positioned adjacent to an edge of a pick yarn bundle;
(iii) a plurality of spaced-apart bundles of warp yarns positioned adjacent to one another, alternately positioned on the first and second sides of the pick yarn bundles and extending between each pick yarn bundle and its corresponding locking yarns;
(iv) a plurality of pairs of leno yarns oriented parallel to the warp yarns, the leno yarns in each pair positioned on opposite sides of the pick yarn bundles and interlocking with each other between each pick yarn bundle and its corresponding locking yarns; and
(v) a plastic coating covering the yarns;
(b) grading to a predetermined height and slope an area of substrate that will support the reinforced earth;

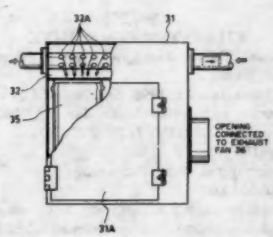
(c) placing a layer of the woven grid on the graded fill in a direction such that the pick yarn bundles and locking yarns are oriented substantially perpendicular to the direction of the grade, the pick yarn bundles acting as anchors and the locking yarns helping lock the pick yarn bundles and the warp yarn bundles into place, and the warp yarn bundles and leno yarns are oriented substantially parallel to the direction of the grade, the warp yarn bundles acting as strength members and the leno yarns helping lock the pick yarn bundles and the warp yarn bundles into place;
(d) placing a layer of fill on the grid; and
(e) grading the layer of fill to a predetermined height and slope.

4,960,350

PROCESS OF STALLING THE SPEEDS OF ARTICLES TO BE CONVEYED IN A PNEUMATIC CONVEYING SYSTEM AND A DEVICE THEREFOR

Yukihiro Tsubata, and Masaru Shiino, both of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jan. 15, 1988, Ser. No. 144,008
Claims priority, application Japan, Jan. 16, 1987, 62-7518
The portion of the term of this patent subsequent to Aug. 22, 2006, has been disclaimed.
Int. Cl.[5] B65G *51/20*
U.S. Cl. 406—84 **6 Claims**



4. A stall device for stalling the speeds of articles to be conveyed in a pneumatic conveying system, wherein the speeds of said articles conveyed by conveying power wind

through a transporting piping are stalled at a position close to the outlet of said transporting piping, said stall device comprising:

sucking means for sucking wind at a wind flow rate higher than the wind flow rate of said conveying power wind through air vents formed at positions close to the outlet side of said transporting piping and sufficiently far from the outlet of said transporting piping to provide a counter flow wind; and

means for providing a counter flow wind flowing in through the outlet side of said transporting piping in a direction opposite to a direction of said conveying power wind, to stall the speeds of said articles at a section between said air vents and the outlet of said transporting piping, wherein said articles are roll film magazines which are conveyed one at a time.

4,960,351

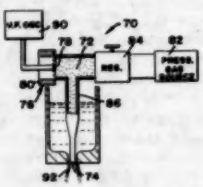
SHELL FORMING SYSTEM

James M. Kendall, Jr., Pasadena; Taylor G. Wang, Glendale, and Daniel D. Elleman, San Marino, all of Calif., assignors to California Institute of Technology, Pasadena, Calif.

Continuation-in-part of Ser. No. 640,928, Aug. 15, 1984, Pat. No. 4,643,854, which is a continuation-in-part of Ser. No. 371,662, Apr. 26, 1982, abandoned. This application Oct. 24, 1986, Ser. No. 922,899

Int. Cl.[5] B29B *9/00*

U.S. Cl. 425—6 **2 Claims**



1. Shell forming apparatus comprising:

means for flowing a gaseous material and a liquid material along substantially concentric merging paths which form a gas-filled liquid extrusion, including flowing the gaseous material between about 1.3 and about 10 times the liquid material velocity, and flowing the liquid material at a velocity at least about equal to the surface wave velocity of the liquid material, to thereby enable the extrusion to spontaneously break up into hollow shells at a predetermined rate in the absence of perturbations;

means for applying perturbations to one of said materials upstream of said liquid extrusion, at a frequency greater than said predetermined rate, whereby to produce smaller shells.

4,960,352

CHAMFERING MACHINE

Katsunobu Kishi, Tokyo, Japan, assignor to Nitto Kohki Co., Ltd., Tokyo, Japan

Filed Jan. 12, 1990, Ser. No. 464,314

Claims priority, application Japan, Jan. 17, 1989, 1-3665[U]

Int. Cl.[5] B23C *1/20*; B27C *5/10*

U.S. Cl. 409—180 **4 Claims**

1. A chamfering machine comprising:

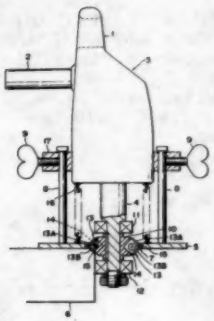
a planar guide base;

a rotary shaft extending at right angles to the guide base;

upward and downward cutting edges attached to the rotary shaft and used to chamfer respective bottom and top edges of a workpiece;

a first rotation guide located above the upward cutting edge so as to be in contact with a lateral face of the workpiece;

a second rotation guide located below the downward cutting edge so as to be in contact with the lateral face of the workpiece; and



adjusting means for retaining the cutting edges and the guide base for relative movement in the axial direction of the rotary shaft and adjusting the relative positions of the cutting edges and the guide base.

4,960,353

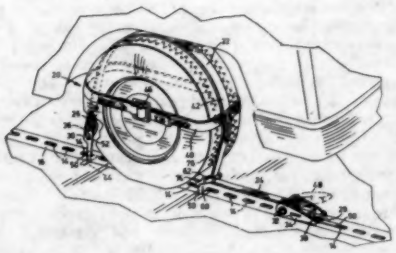
WHEEL ANCHORING HARNESS FOR MOTOR VEHICLE TRANSPORTATION SYSTEMS

Robert J. Thorndyke, Oshawa, Canada, assignor to Thorfam Corp., Oshawa, Canada

Filed Jun. 6, 1989, Ser. No. 362,093

Int. Cl.[5] B60P *3/06*; B60T *3/00*

U.S. Cl. 410—20 **2 Claims**



1. A wheel harness for anchoring a wheel of a motor vehicle with respect to the floor of a transportation vehicle comprising;

(a) an elongated strap having first and second ends and a sufficient length between said ends to extend around the wheel from points on the floor of the transport vehicle located forwardly and rearwardly of the vehicle to embrace a portion of the circumference of the wheel,

(b) first and second anchor means at said first and second ends of said strap for securing said first and second ends of said strap with respect to the floor of the transportation vehicle, and

(c) wheel chock means slidably mounted on said strap between the first and second anchor means for movement with respect to the first and second anchor means, said wheel chock means being adapted to be releasably secured to the floor in close proximity to a wheel in use to form a chock which will bear against the wheel to prevent movement of the wheel in use,

(d) length adjustment means on said strap, and spaced from

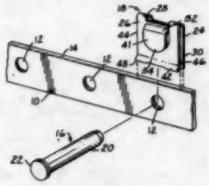
the wheel chock means, for adjusting effective length of the strap to increase or decrease the effective length of the strap to tighten or release the harness with respect to the wheel in use.

4,960,354

HEADED FASTENER RETAINER CLIP

Richard B. Moore, 636 Wellington Cresent, Mount Clemens, Mich. 48043

Filed Dec. 13, 1989, Ser. No. 450,041
Int. Cl.[5] F16B *21/18*
U.S. Cl. 411—523 **3 Claims**



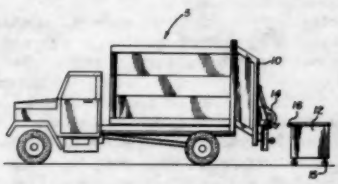
1. A retainer clip for retaining a fastener having a head and a shank in a hole in a plate comprising: a single U-shaped strip of flexible resilient material having first and second legs integrally connected by a bight and adapted to engage over the edge of the plate with said first and second legs embracing the plate hole, said first leg having a first clearance for the shank of the fastener extending through the plate hole and said second leg having a second clearance for the head of such fastener, said first leg having laterally spaced apart side edges and a transverse edge opposite said bight, said first clearance comprising a slot between said side edges extending through said transverse edge and having a width greater than that of the shank of the fastener, said second leg having laterally spaced apart side edges and a transverse edge opposite said bight, said second clearance comprising an opening spaced inwardly of said bight and said side and transverse edges of said second leg and completely surrounded by the material of said second leg, said second leg having a tab, said tab having a retainer portion substantially parallel to and spaced outwardly of said second leg and overlying at least part of said opening and the head of the fastener received therein, said tab having an end portion integrally connected to the edge of said opening adjacent said bight, said retainer portion of said tab extending from said end portion thereof across at least the major portion of said opening, said opening in said second leg being formed by the displacement of a portion of the material thereof and said tab being formed of such displaced material.

4,960,355

APPARATUS FOR TRANSFERRING REFUSE FROM CONTAINERS INTO REFUSE EQUIPMENT

Stanley W. Worthington, Waterloo, Iowa, assignor to Waste Management of North America, Inc., Oak Brook, Ill.

Filed Jan. 17, 1989, Ser. No. 297,031
Int. Cl.[5] B65F *3/00*
U.S. Cl. 414—408 **26 Claims**



1. A container apparatus for use with containers of the type having a pin extending from the container; the apparatus comprising:

means for selectively locking said pin in a fixed rotatable position relative to said apparatus, and

means for rotating said container about said pin, with the pin locked in the fixed rotatable position, for inverting said container from an upright position while said pin is in locking engagement with said locking means,

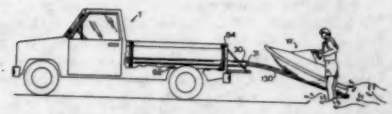
said rotating means being disposed in a fixed position until said pin becomes locked in the fixed position relative to said apparatus and being thereafter operative to rotate said container about said pin for inverting said container.

4,960,356

JET PROPELLED WATERCRAFT LOADING AND STORING APPARATUS

Bruce E. Wrenn, Roxboro, N.C., assignor to Personal Watercraft Creations, Inc., Roxboro, N.C.

Filed Nov. 29, 1989, Ser. No. 442,662
Int. Cl.[5] B65G *67/02*
U.S. Cl. 414—537 **6 Claims**



1. An apparatus for loading, unloading and storing a jet propelled water vehicle of the type having a pair of parallel grooves formed in its hull and extending for substantially the length thereof comprising:

(a) a first pair of horizontal parallel hollow tubes having substantially smooth external surfaces and of a shape and size suited to serving as supporting tracks for sliding the jet propelled water vehicle thereon between leading and trailing ends thereof with the hull grooves thereof resting on said tubes;

(b) a second pair of parallel hollow tubes having substantially smooth external surfaces slidably mounted within said first pair of tubes and extendable therefrom to provide an extension of the supporting tracks formed by said first pair of tubes, said second pair of tubes having leading and trailing ends and in one mode being bendable such that when the leading ends of each of the second pair of tubes are nested in respective trailing ends of said first pair of tubes, said second pair of tubes tend to bend when the weight of the jet propelled water vehicle is received by the trailing ends of said second pair of tubes in transferring the vehicle from the second to the first pair of tubes and in another mode when said second pair of tubes rest on a support located at substantially the same elevation as said first pair of tubes, said second pair of tubes provide horizontal supporting tracks for storing said vehicle;

(c) first support means for adjustably spacing and supporting the said leading and trailing ends of said first pair of tubes; and

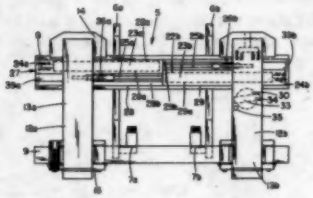
(d) spacer means joining the trailing ends of said second pair of tubes and operative to maintain said trailing ends of said second pair of tubes spaced apart a distance substantially equal to the distance said first pair of tubes are spaced apart and mating the spacing of the hull grooves of the vehicle to be transported thereon.

4,960,357

MOBILE FORK LIFTING APPARATUS

Jens Laursen, Lemvig, Denmark, assignor to JL Forklift Truck A/S, Lemvig, Denmark

Filed Jul. 7, 1988, Ser. No. 216,318
Claims priority, application Denmark, Jul. 31, 1987, 4023/87
Int. Cl.[5] B66F 9/14
U.S. Cl. 414—667 6 Claims



1. A mobile fork lifting apparatus comprising:

a mast;

a fork carriage connected to the mast and supported by said mast for vertical movement therealong, and including top and bottom parallel horizontal transverse girders;

left and right fork assemblies supported for horizontal transverse movement along the girders, each fork assembly including (i) an L-shaped body, (ii) a top roller sub assembly connected to the L-shaped body of the fork assembly and supported for rolling movement along the top girder, and (iii) a bottom roller subassembly connected to the L-shaped body of the fork assembly and supported for rolling movement along the bottom girder;

a first extensible hydraulic cylinder connected to the fork carriage and to the left fork assembly to move said left fork assembly horizontally along the transverse girders; and

a second extensible hydraulic cylinder connected to the fork carriage and to the right fork assembly to move said right fork assembly horizontally along the transverse girders;

wherein at least one of the girders has a U-shaped cross-section forming a forwardly facing recess, and at least one of the hydraulic cylinders is arranged at least substantially in said recess;

wherein the fork carriage further comprises

(i) a screen connected to said one girder and substantially covering said recess,

(ii) first connecting means connecting the first hydraulic cylinder to the left fork assembly, and

(iii) second connecting means connecting the second hydraulic cylinder to the right fork assembly; and

wherein the screen forms a longitudinal slot, and one of said connecting means extends through said longitudinal slot.

4,960,358

BOTTOM-UNHEADING DEVICE AND METHOD FOR VERTICAL VESSELS

Frank A. DiGiacomo; Alan J. Malsbury, both of Parsippany, and Ronald T. Myszka, Hopatcong, all of N.J., assignors to Foster Wheeler USA Corporation, Clinton, N.J.

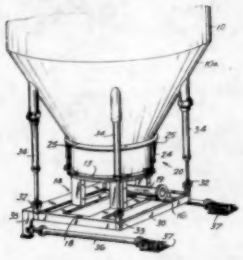
Continuation of Ser. No. 148,587, Jan. 26, 1988, abandoned. This application Aug. 4, 1989, Ser. No. 390,423
Int. Cl.[5] C10B 43/02
U.S. Cl. 414—684.3 7 Claims

1. An improved unheading device adapted for removal and replacement of a lower cover unit for a vertical vessel, comprising:

(a) a cover unit adapted for being sealably attached by bolts to a lower flange of a lower flanged opening in a vertical vessel, said cover unit including a supporting cradle means;

(b) at least eight pivotable clamping means each including a detensioning means said clamping means being substantially equally spaced around the perimeter of said cover unit and adapted for detensioning and pivotably removing the bolts located in said cover unit and the lower flange of the vessel so as to unfasten said cover unit from the vessel;

(c) a lifting frame means located below said cover unit and said cradle means, said lifting frame being supported from said vessel and vertically movable by four equally-spaced vertically-oriented piston actuator means; and



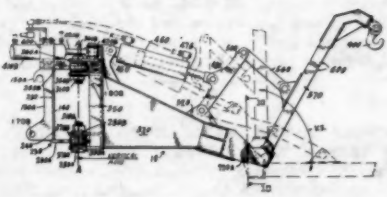
(d) carriage means adapted for providing lateral movement of the cover unit relative to the lifting frame means by dual horizontal piston actuator means, said carriage means being at least partly supported by said lifting frame during lateral movement of the cover unit, whereby the cover unit can be lowered from the vessel lower flange and moved aside laterally to permit material removal through the lower opening in the vessel, and then reconnected to the vessel lower flange.

4,960,359

DEMOUNTABLE SWING BOOM HOIST FOR FRONT END LOADERS

Estel L. Lovitt, Jr., 2266 Brendon Way, Sylvania, Ohio 43560

Filed Jan. 23, 1989, Ser. No. 299,671
Int. Cl.[5] B65G 69/00; B66F 3/72; E02F 3/28
U.S. Cl. 414—686 1 Claim



1. A swing boom hoist apparatus for temporary attachment to a motor vehicle, having a chassis, said apparatus comprising in combination:

(a) a connecting member of vertical disposition, and wherein said connecting member comprises two parallel support brackets affixed to a frontal portion of said vehicle chassis, and wherein said connecting member further comprises two parallel inner support brackets which are disposed inside of such outer support brackets and each which inner support bracket is connected only to the nearest adjacent outer support bracket, and wherein said connecting member has a cylindrical bar member integrally affixed in a transverse manner between such inner support members, and wherein said connecting member has cylin-

drical connecting pins integrally affixed adjacent said cylindrical member;

(b) a longitudinally extending crane member with a frontal portion and a posterior portion, said crane member having a pair of connecting pawl members integrally disposed on the posterior portion of said crane member, said connecting pawls being interconnected to the frontal portion of said connecting member by joining each said pawl member to each of said connecting pins on said connecting member, and said crane member having hydraulically operated and horizontally rotatable hinge means on the posterior portion of said crane member so as to permit said crane to move about said hinge in a horizontal plane and about a vertical axis said hinge means comprising in part a triangular-shaped brace means on the forward portion of said hinge means member, as seen from an upper elevational view;

(c) secondary boom means affixed to said crane member said second boom means comprising a bifurcatred member comprised of parallel plate members;

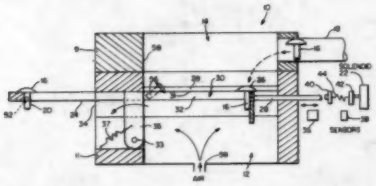
(e) intermediate boom member connected to said secondary boom members.

4,960,360

RIVET ORIENTATION DEVICE AND METHOD

Ottavio Giannuzzi, Baldwin, and Walter Woelfel, Walton, both of N.Y., assignors to Grumman Aerospace Corporation, Bethpage, N.Y.

Filed Jul. 19, 1989, Ser. No. 381,886
Int. Cl.[5] B65G *47/24*
U.S. Cl. 414—755 **8 Claims**



7. A method for ensuring proper orientation of a fastener comprising the steps of:

feeding the fastener to a first point;

guiding the fastener along a track between the first point and second pick-up point;

stopping the fastener before the second point if it has an improper orientation;

exposing the fastener to a fluid blast thereby tumbling the fastener if it becomes stopped thus enabling the fastener to assume a proper orientation thereafter; and

interposing an obstruction in the track which yields for a properly positioned fastener but which retains an improperly oriented fastener in a stopped position until it is tumbled into a proper orientation.

4,960,361

SEPARATING SHEETLIKE STRUCTURES FROM PILES

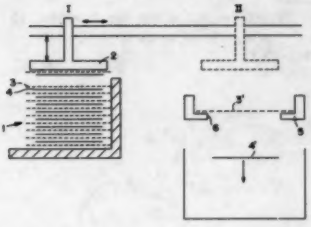
Jaroslav Melzer, Ludwigshafen, Fed. Rep. of Germany, assignor to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Apr. 5, 1989, Ser. No. 333,418
Claims priority, application Fed. Rep. of Germany, Apr. 7, 1988, 3811634
Int. Cl.[5] B65H *3/00*; B65G *59/00*
U.S. Cl. 414—786 **2 Claims**

1. A process for separating sheetlike structures of air permeable material from a pile by vacuum lifting, said process comprising the steps of

assembling said pile by interleaving said structures of air permeable material in alternating sequence, with interlayer sheets of air impermeable material,

vacuum lifting each said structure from said pile together with the respective underlying one of said air impermeable interlayer sheets,



transporting any given one of said lifted structures together with its respective underlying interlayer sheet to a processing station,

releasing said structure and said interlayer sheet, and

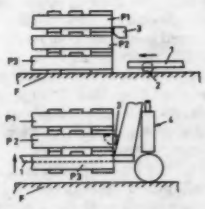
separating said interlayer sheet from said structure.

4,960,362

PALLET DISPENSER

Ladislav S. Karpisek, 86 Woodfield Boulevarde, Caringbah, New South Wales, 2229, Australia

Filed Aug. 29, 1989, Ser. No. 400,161
Claims priority, application Australia, Aug. 31, 1988, PJ0140
Int. Cl.[5] B65G *59/06*
U.S. Cl. 414—797.4 **5 Claims**



1. A pallet dispenser including a holder for a number of rectangular pallets arranged in a stack one on top of another, a pallet removal opening in said holder at the foot of one side of the holder, a vertically movable support member external to the holder, a first pair of pallet support fingers and an oppositely positioned second pair of pallet support fingers, mounting means on said support member for said pairs of fingers to allow horizontal movement of said finger pairs away from each other and towards each other to an inner working position where said fingers will lie in a space between upper and lower battens at opposite sides of a pallet in the holder, first biassing means to urge said finger pairs towards each other, said support member having an elevated operational position in which said first biasing means urges said fingers against said upper battens of a second lowest pallet of a pallet stack in the holder so that, upon raising of the pallet stack, the fingers move into said space, said support member also having a lowered operational position where said fingers will be below the underface of the upper battens of the lowermost pallet of a pallet stack in the holder, second biasing means biassing the support member to its elevated operational position, releasable lock means to retain said support member in its elevated operational position, manually operated linkage means to engage and

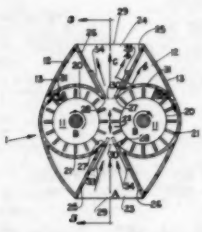
release said lock means and separate said finger pairs against the action of said first biassing means.

4,960,363

FLUID FLOW DRIVEN ENGINE

Frank D. Bergstein, 11464 Lippelman Rd., Suite 200, Cincinnati, Ohio 45246

Filed Aug. 23, 1989, Ser. No. 397,519
Int. Cl.[5] F03D 7/00
U.S. Cl. 415—3.1 3 Claims



1. A reversible fluid flow driven engine comprising:
(a) a base;
(b) a pair of rotors rotably mounted on said base for selective rotation in opposite directions depending upon the direction of fluid flow, said rotors each comprising a cylindrical drum mounting a plurality of circumferentially spaced impellers projecting radially outward from said drum, said rotors being mounted in side-by-side spaced relation to define a fluid flow passageway between said drums;
(c) a housing mounted on said base so as to surround said rotors, said housing having opposing outer peripheral walls terminating at their opposite ends in identical pairs of inwardly directed planar wall surfaces defining inwardly tapered passages communicating at their inner ends with the opposite ends of said passageway, said housing having an inner semi-cylindrical peripheral walls partially surrounding said rotors, said semi-cylindrical inner peripheral walls extending between the inner ends of the inwardly direction wall surfaces at one end of said opposing outer peripheral walls to the corresponding inner ends of the inwardly directed wall surfaces at the opposite end of said outer peripheral walls;
(d) planar extension plates slidably mounted on said pairs of inwardly directed walls for movement in parallel relation thereto, said extension plates being displaceable inwardly beyond the innermost ends of said inwardly directed walls so as to vary the width of said passages at their innermost ends and thereby vary the velocity of a fluid flowing into said passageway;
(e) actuating means for selectively extending said pairs of extension plates beyond the innermost ends of said inwardly directed walls;
(f) reversible drive means for operatively connected said rotors to an energy generating system; and
(g) said drums having a radius at least twice the width of said impellers, and the width of said passages at their outermost ends being at least three times greater than the smallest distance between said drums.

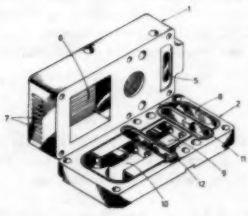
4,960,364

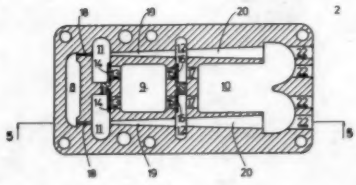
VACUUM EJECTOR DEVICE

Peter Tell, Breviksvägen 27, S-184 22 Åkersberga, Sweden

Filed Jun. 6, 1989, Ser. No. 363,065
Claims priority, application Sweden, Jun. 8, 1988, 8802143
Int. Cl.[5] F04F 5/00
U.S. Cl. 417—174 7 Claims

1. Multi-ejector device comprising at least one ejector part comprising a substantially rectangular plate, said plate including at least two sets of ejector nozzles each set including a first nozzle, which communicates with a pressure chamber, axially spaced from a second nozzle which is axially spaced from a third nozzle which communicates with an outlet chamber, a first set of said at least two sets of nozzles being located at a first longitudinal side of said plate, and a second set of said at least two sets of nozzles being located at an opposite second longitudinal side of said plate, a first valve chamber extending transversely relative to each longitudinal side and communicating with and located between each first nozzle and each second nozzle, and a second valve chamber extending transversely relative to each longitudinal side and communicating with and located between each second nozzle and each third nozzle, a collection chamber being in communication with said first valve chamber through first openings extending from said





first valve chamber to said collection chamber and in communication with said second valve chamber through second openings extending from said second valve chamber to said collection chamber, said collection chamber being positioned between said first and second valve chambers and said second nozzles, said outlet chamber being in communication with said second valve chamber through third openings extending from said second valve chamber to said outlet chamber, a first check valve mounted in each first opening to allow air to flow only in a direction from said collection chamber to said first valve chamber, and a second check valve mounted in each second opening to allow air to flow only in a direction from said collection chamber to said second valve chamber, each nozzle, chamber and opening being shaped directly within and integral with said plate, and means for attachment to said plate for enclosing said at least one ejector part.

4,960,365

HYDRAULIC CONTROL APPARATUS

Hitoshi Horiuchi, Settsu, Japan, assignor to Daikin Industries, Ltd., Osaka, Japan

Filed Nov. 29, 1989, Ser. No. 442,625
Claims priority, application Japan, Dec. 1, 1988, 63-306438; Oct. 5, 1989, 1-260661
Int. Cl.[5] F15B 13/043, 13/044
U.S. Cl. 417—222 11 Claims

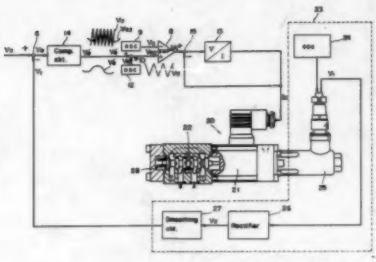
1. A hydraulic control apparatus having a switching element (3) which is changed over by a control signal (Vc) inputted to an input terminal (B) thereof; and a solenoid controlled valve (SV) having a spool actuated by a DC solenoid (1) to be driven

by exciting current whose pulse duration has been controlled by the switching element (3) comprising:

an adder (10) for adding a command signal (Vo) and an AC signal (Vd) having a dither frequency to each other;

an oscillator (9) for generating a signal (Va) having a constant frequency higher than the maximum frequency of the command signal (Vo);

a subtractor (6) for subtracting a signal (Vf) representing



pulse duration of the exciting current and inputted through a low-pass filter (5) from a signal outputted from the adder (10); and

a comparator (8) for comparing a signal (Ve) outputted from the subtractor (6) with a signal (Va) outputted from the oscillator (9), outputting a pulse width-modulated control signal (Vc) to the input terminal (B) of the switching element (3) so as to control the ON and OFF of the switching element (3).

4,960,366

SLANT PLATE TYPE COMPRESSOR WITH VARIABLE DISPLACEMENT MECHANISM

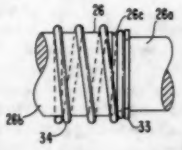
Teruo Higuchi, Isesaki, Japan, assignor to Sanden Corporation, Gunma, Japan

Filed Apr. 28, 1989, Ser. No. 344,381

Claims priority, application Japan, Apr. 28, 1988, 63-58355[U]

Int. Cl.[5] F04B 1/26

U.S. Cl. 417—222 **11 Claims**



3. In a slant plate type compressor, said compressor including a compressor housing having a cylinder block provided with a plurality of cylinders, a front end plate disposed on one end of said cylinder block and enclosing a crank chamber within said cylinder block, a piston slidably fitted within each of said cylinders, a drive shaft rotatably supported in said housing, and coupling means for drivingly coupling said pistons with said drive shaft such that rotary motion of said drive shaft is converted into reciprocating motion of said pistons within said cylinders, said coupling means including a slant plate disposed on said drive shaft and undergoing rotational motion with said drive shaft, said slant plate having a surface disposed at a slant angle relative to a plane perpendicular to said drive shaft, said slant angle adjustable between a maximum and a minimum angle and changing in response to a change in pressure in said crank chamber to change the capacity of said compressor, a rear end plate disposed on the opposite end of said cylinder block from said front end plate and defining a suction chamber and a discharge chamber therein, a communication path linking said crank chamber with said suction chamber, a valve control means for controlling the opening and closing of said communication path to control the pressure in said crank chamber, a bias spring mounted about said drive shaft at a location between said slant plate and said cylinder block to urge said slant plate towards the maximum slant angle, the improvement comprising:

said drive shaft having an inner portion having a smaller diameter than the remainder of said drive shaft, said inner portion and said remainder integrally formed, said bias spring having one end having an inner diameter smaller than the diameter of said remainder of said drive shaft, said one end of said bias spring being the end disposed further away from said slant plate, said bias spring disposed on said drive shaft such that said one end is opposite said slant plate and said one end is secured to said drive shaft adjacent a location of said drive shaft where said inner portion and said remainder are integrally formed.

4,960,367

SLANT PLATE TYPE COMPRESSOR WITH VARIABLE DISPLACEMENT MECHANISM

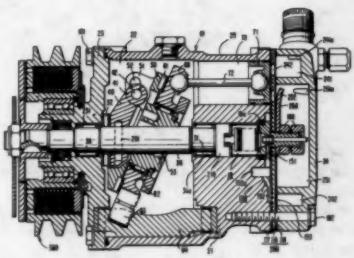
Kiyoshi Terauchi, Isesaki, Japan, assignor to Sanden Corporation, Gunma, Japan

Filed Nov. 28, 1988, Ser. No. 276,798

Claims priority, application Japan, Nov. 27, 1987, 62-297700

Int. Cl.[5] F04B 1/28

U.S. Cl. 417—222 **21 Claims**



1. In a refrigerant compressor including a compressor housing having a cylinder block provided with a plurality of cylinders, a front end plate disposed on one end of said cylinder block and enclosing a crank chamber within said cylinder block, a piston slidably fitted within each of said cylinders and reciprocated by a drive mechanism including a rotor connected to a drive shaft, an adjustable slant plate having an inclined surface adjustably connected to said rotor and having an adjustable slant angle with respect to said drive shaft, and linking means for operationally linking said slant plate to said pistons such that rotation of said drive shaft, rotor and slant plate reciprocates said pistons in said cylinders, said slant angle changing in response to a change in pressure in said crank chamber to change the capacity of said compressor, a rear end plate disposed on the opposite end of said cylinder block from said front end plate and defining a suction chamber and a discharge chamber therein, a passageway linking said suction chamber with said crank chamber and a valve control means for controlling the opening and closing of said passageway, the improvement comprising:

said valve control means comprising a longitudinally expanding and contracting bellows and a valve member attached at one end of said bellows to open and close said passageway, a cylinder member having a first end adjacent to said valve member, and an actuating rod slidably

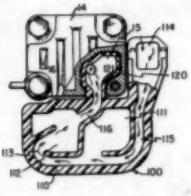
disposed within said cylinder member and receiving the discharge pressure at one end so as to longitudinally move and thereby apply a force to and move said valve member to shift the control point of said bellows in response to changes in discharge pressure.

4,960,368

SUCTION SYSTEM FOR HERMETIC COMPRESSOR OF REFRIGERATION

Dietmar E. B. Lilie, Joinville, Brazil, assignor to Empresa Brasileira de Compressores S/A-Embraco, Joinville-Sc, Brazil

Filed Jun. 12, 1989, Ser. No. 365,375
Claims priority, application Brazil, Jul. 29, 1988, 8804016
Int. Cl.[5] F04B *39/00*
U.S. Cl. 417—312 **8 Claims**



1. A suction system for a hermetic compressor, said compressor comprising:

a cylinder block;

a piston;

means for reciprocating said piston within said cylinder;

head means for said cylinder having suction and discharge chambers;

a value plate on the cylinder having suction and discharge valves communicating with the suction and discharge chambers of the head;

a suction muffler comprising:

a housing formed with first and second internal chambers;

an inlet to said housing to supply refrigerant gas;

an elongated duct formed on the internal periphery of said housing with a first and a second portion each having an inlet and an outlet end, the inlet end of said duct first portion in communication with the housing inlet for that refrigerant gas, the wall area of said first chamber having an opening in communication with the outlet end of said duct first portion;

the inlet end of said duct second portion being axially aligned with the outlet end of said first duct portion;

an opening in the wall area of said second chamber at which the outlet end of said second duct portion is in communication to supply the refrigerant gas to said second chamber,

an outlet section formed integrally with said housing; to be mounted to the cylinder within the head, said outlet section having a plenum overlying the suction valve of the valve plate;

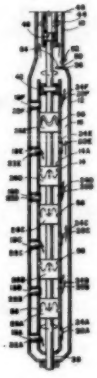
and a gas outlet passage formed in said housing from the outlet of said second chamber to the inlet of said plenum of the outlet section.

4,960,369

ROTATABLY DRIVEN POSITIVE DISPLACEMENT PUMP

John G. Graves, 3107 Woodward Blvd., Tulsa, Okla. 74105

Filed Jun. 26, 1989, Ser. No. 371,258
Int. Cl.[5] F04B *3/00, 9/04*
U.S. Cl. 417—536 **6 Claims**



1. A rotationally driven positive displacement pump, comprising:

a tubular conduit;

a barrel affixed in axial alignment with one end of said conduit, the barrel having a plurality of pairs of spaced apart fluid inlet and fluid outlet ports, each inlet port being controlled by an unidirectional fluid inlet valve and each outlet port being controlled by an unidirectional fluid outlet valve, the barrel providing an internal cylindrical surface;

a plurality of pistons reciprocally supported within said barrel, there being a piston between each pair of inlet and outlet ports, each piston having an axial opening therethrough and having a continuous substantially sinusoidal wave-shaped groove in the internal surface of said axial openings;

chamber means communicating said barrel fluid outlet ports with said tubular conduit, said barrel fluid inlet ports being exposed to a fluid containing environment;

a drive shaft rotatably and non-axially, displaceably received in said barrel and within each said piston axial openings;

means within said tubular conduit connected to said drive shaft for the rotation thereof;

a crank member affixed to said drive shaft for each said piston, each crank arm extending slideably within said wave-shaped groove in the internal surface of a piston, the wave-shaped grooves of adjacent pistons being rotationally displaced for each other relative to the corresponding crank members; and

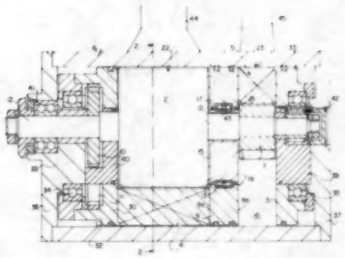
means to limit the rotation of each of said pistons whereby the rotation of said drive shafts causes said pistons to axially displace relative to said barrel and relative to each other whereby when adjacent pistons move away from each other fluid is drawn through the appropriate inlet port into said barrel, and when said pistons move toward each other, fluid is displaced from with said barrel through said appropriate outlet port.

4,960,370

INTERNAL AXIS ROTARY PISTON MACHINE

Frank Obrist, Christophstrasse 24, 6850 Dornbirn, Austria; Felix H. Wankel, deceased, late of Heidelberg, Fed. Rep. of Germany; by Gerhard Renz, executor, Schlo trasse 75, Stuttgart, Fed. Rep. of Germany; by Fried Meysen, executor, Kastellweg 35, Heidelberg, Fed. Rep. of Germany, and by Thomas Burkhardt, executor, Rohrbacher Strasse 18, Heidelberg, Fed. Rep. of Germany

Filed Apr. 14, 1989, Ser. No. 338,810
Claims priority, application Austria, Apr. 15, 1988, 3812637
Int. Cl.[5] F01C *1/30*
U.S. Cl. 418—9 10 Claims



1. An internal axis rotor piston machine comprising:
(a) a common shaft;
(b) at least two internal rotors fixed to said common shaft;
(c) external rotors corresponding in number to said internal rotors, and defined by annular end bodies (30, 31) in the axial direction;
(d) a common casing enclosing said internal rotors and said external rotors;
(e) said external rotors having engagement parts rigidly and circumferentially connected to one another, said internal rotors having engagement parts interacting with said engagement parts of said external rotors.
(f) at least one rotor disk axially connecting each said external rotor, to an adjacent external rotor, said rotor disk having an annular space and so disposed as to surround said common shaft;
(g) a partition body situated in said annular space between the rotor disk and said common shaft; and
(h) working spaces formed between the engaging parts of the external rotors and respectively between the rotor disk (9) and annular end bodies (30, 31), and further defined by said inner rotors as they depend from their rotary position, said working spaces extending up to said partition body.

4,960,371

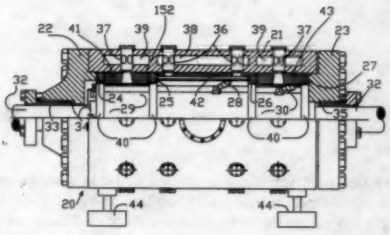
ROTARY COMPRESSOR FOR HEAVY DUTY GAS SERVICES

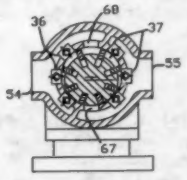
H. Eugene Bassett, 10507 Jody Ct., Houston, Tex. 77099

Filed Jan. 30, 1989, Ser. No. 302,974
Int. Cl.[5] F04C *18/344, 29/10*
U.S. Cl. 418—13 11 Claims

1. An improved rotary gas compression apparatus comprising a singular housing having a substantially cylindrical inside surface to provide a closed working chamber, said working chamber having three expansible chambers each substantially isolated from the other, each said expansible chamber having a cylinder liner substantially cylindrical on the outside and interior with the said interior axis eccentric to the axis of said housing inside surface and said cylinder liner outside surface, said housing and said cylinder liners having inlet and outlet ports communicating with said cylinder liner said interior surface, a rotor mounted in said expansible chambers and rotatable about an axis eccentric to the axis of said cylinder liner interior surfaces, said rotor having a plurality of articulated volume displacers mounted on said rotor periphery slidably engaging said cylinder liner said interior surfaces, said volume displacers have actuators mounted on at least one end of said rotor for control of duration of slidable engagement with said cylinder liner said interior surfaces;

a. said housing having one or more one way automatic pressure actuated gas inlet control valves in the communication path to each said expansible chamber for enabling inlet gas flow into said expansible chamber whenever pressure on the inlet side of said inlet control valve is equal to or greater than pressure in said expansible chamber while inhibiting gas flow from said expansible chamber in the direction of said inlet gas source whenever said gas





pressure within said expansible chamber is substantially greater than pressure on said inlet side of said control valve,

b. said housing having one or more one way automatic pressure actuated gas outlet control valves in the communication path from each said expansible chamber for enabling outlet gas flow from said expansible chamber whenever pressure on the outlet side of said outlet control valve is substantially less than pressure in said expansible chamber while inhibiting gas flow from said outlet side of said outlet control valve in the direction of said expansible chamber whenever gas pressure on said outlet side of said outlet control valve is substantially greater than pressure on said inlet side of said outlet control valve.

4,960,372

COMPRESSOR WITH AN ISOLATED VANE SLOT

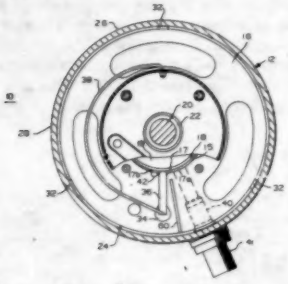
Gary O. Scheldorf, Greenville, Ind.; James F. Gordon, and Owen H. Scheldorf, both of Louisville, Ky., assignors to General Electric Company, Louisville, Ky.

Filed Sep. 29, 1989, Ser. No. 414,465
Int. Cl.[5] F04C *18/332*
U.S. Cl. 418—63 5 Claims

1. A rotary compressor comprising:
a cylinder having an outer peripheral wall and a pair of spaced apart end walls and a cylindrical compression chamber therein;
a cylindrical piston eccentrically movable within said chamber;

a vane slot in said cylinder extending outwardly from and communicating with said chamber;

a vane reciprocatingly mounted in said vane slot for selective protrusion into and retroaction from said chamber so as to contact said piston as it moves within said chamber to divide said chamber into a suction side and a compression side;



a suction port positioned on the suction side of said vane and communicating with said chamber, and a discharge port positioned on the compression side of said vane and communicating with said chamber; and

at least one noise reduction slot projecting into said cylinder from its outer peripheral wall near said vane slot and extending completely between said end walls.

4,960,373

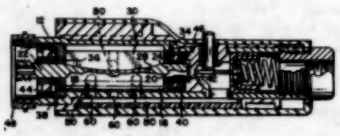
FLUID MOTOR ROTOR ASSEMBLY

Gregory P. Albert, Waverly, N.Y., assignor to Ingersoll-Rand Company, Woodcliff Lake, N.J.

Filed Mar. 17, 1989, Ser. No. 325,568

Int. Cl.[5] F01C *13/02*

U.S. Cl. 418—270 **4 Claims**



1. A rotor assembly for a vane motor comprising:

a cylindrical rotor body having front and rear faces, front and rear shaft portions extending axially from the respective faces, front and rear bearings for rotatably supporting said shaft portions, respectively, and radial slots extending axially along the rotor body;

a plurality of radially slidable vanes disposed in said radial slots;

a rear end plate, having the same outside diameter as that of said rotor body and substantially the same as that of said rear bearing, fixed to the rear face of said rotor body on said rear shaft so as to rotate with said rotor body and to completely close the slots at the rear face;

a front spacer member positioned on the front shaft portion so as to abut the front face of the rotor body; and

a front end plate radially circumscribing the front spacer member so as to close the slots at the front face while allowing relative rotation between said spacer and said front end plate.

4,960,374

APPARATUS FOR MOLDING OUTER AND INNER SOLES AND A SOLE WELT ONTO SHOE UPPERS

Manfred Pröll, Achim-Baden, Fed. Rep. of Germany, assignor to Klöckner Ferromatik Desma GmbH, Fed. Rep. of Germany

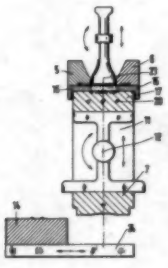
Filed Apr. 19, 1989, Ser. No. 340,270

Claims priority, application Fed. Rep. of Germany, Apr. 26, 1988, 3813993

The portion of the term of this patent subsequent to Mar. 7, 2006, has been disclaimed.

Int. Cl.[5] B29C *45/16*

U.S. Cl. 425—119 **2 Claims**



1. An apparatus for molding outer and inner soles and a sole welt on to shoe uppers, comprising a pivotable mold carrier having opposed sides, a first mold part mounted on one of said sides and a second mold part mounted on the other of said sides, a transversely movable mold plate confronting said first mold part in a first molding cycle, said first mold part defining together with said mold plate a first mold cavity into which plasticized thermoplastic material is injected for molding an outer sole, a last supported shoe upper confronting said second mold part in said first molding cycle, a first pair of mold elements laterally movable between closed and opened positions overlying said second mold part and being closed against the shoe upper during said first cycle for defining a sole welt mold cavity into which plasticized thermoplastic material is injected for molding on to the shoe upper a sole welt closed on itself simultaneously with the injection of thermoplastic material for molding the outer sole, a second pair of mold elements laterally movable between closed and opened positions underlying said first pair of mold elements and being open during said first cycle, said first mold part with said molded outer sole confronting the she upper during a second mold cycle upon pivotal movement, said second pair of mold elements being closed during said second cycle to define with the outer sole and the she upper an inner sole cavity into which foam plasticized thermoplastic material is injected for molding an inner sole.

4,960,375

DIE FOR PROFILE EXTRUSION

Yoshio Saito, and Shigeo Yoshino, both of Chiba, Japan, assignors to Kinugawa Rubber Industrial Co., Ltd., Chiba, Japan

Filed Mar. 23, 1989, Ser. No. 327,524

Claims priority, application Japan, Mar. 24, 1988, 63-70488

Int. Cl.[5] B29C *47/12*

U.S. Cl. 425—131.1 **13 Claims**

1. A die for profile extrusions for forming an article including first and second profile sections, which comprises a stationary die and a movable die, slidable with respect to the stationary die, comprising:

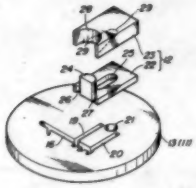
a first feed path for feeding article material for the first profile section of the article;

a first outlet port, provided in the stationary die, communicating with said first feed path, said first outlet port having a cross sectional profile corresponding to a cross sectional

profile of the first profile section of the article so that the flow of the article material supplied from said first feed path is restricted to define the first profile section of the article;

a second feed path for feeding article material for the second profile section of the article;

a second outlet port, provided in the movable die, communicating with said second feed path, said second outlet port having a cross sectional profile corresponding to a cross sectional profile of the second profile section of the article so that the flow of the article material supplied from said second feed path is restricted to define the second profile section;



a third feed path independent of said second feed path for feeding article material; and

an opening, provided in the stationary die, communicating with said third feed path, said opening defining a third outlet port according to the movement of the movable die with respect to the stationary die, said third outlet port having a cross sectional profile corresponding to a cross sectional profile of an additional profile section to the second profile section of the article so that the flow of the article material supplied from said third feed path is restricted to vary the geometry of the second profile section.

4,960,376

APPARATUS FOR MAKING A PLASTIC CONTAINER WITH INTEGRAL HANDLING RING

Theodore H. Udell, West Chester, Pa., assignor to Container Corporation of America, Clayton, Mo.

Filed Jun. 22, 1989, Ser. No. 369,954

Int. Cl.[5] B29C *49/30*

U.S. Cl. 425—525 **11 Claims**

1. Molding apparatus for making a thermoplastic container including a hollow cylindrical body, formed by blow molding a hollow parison, and a solid integral handling ring, formed and welded to the body by compression molding a mass of solid extrudate, said apparatus comprising:

(a) a pair of mold members mounted for transverse movement relative to each other between closed and open positions and each including a side section, an end section, and corner section;

(b) said end sections being mounted for axial movement between fill, compression, and part removal positions and being positioned to cooperate with said side section to define a generally cylindrical cavity for receiving an extruded parison, to form a hollow container body, and to define an annular cavity for receiving a mass of extrudate, to form a solid integral container handling ring;

(c) said corner sections being mounted for axial movement in said annular cavity between fill, compression, and part removal positions and being positioned to compress said extrudate to form a container handling ring and to weld said ring to said container body at the same time said body is being formed by blow molding;

(d) said side, end, and corner sections being positioned to cooperate to close off said annular cavity from said cylindrical cavity when said sections are in the fill position;

(e) an extruder nozzle positioned to inject a mass of extrudate into said annular cavity when said end and corner sections are in the fill position.

4,960,377

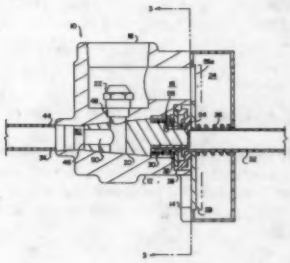
GAS/AIR MIXING VALVE

Maurice Nunes, Arlington; Michael P. Grimanis, Medford; James R. Hurley, Weymouth, and Kailash C. Shukla, Stow, all of Mass., assignors to Gas Research Insitute, Chicago, Ill.

Filed May 17, 1989, Ser. No. 353,024

Int. Cl.[5] F23N *1/02*

U.S. Cl. 431—12 **7 Claims**



1. A gas/air mixing valve for connection to an air plenum to regulate the flow of combustion reactants to a burner, comprising:

a valve body defining a gas inlet for receiving a supply of combustion gas, a combustion air inlet orifice in communication with the air plenum for receiving a supply of air for combustion, a bleed air orifice in communication with the air plenum for receiving air from the air supply which is not wanted for combustion and venting the unwanted air to atmosphere, and a gas/air mixing chamber for mixing the combustion gas with the air flowing through the combustion air inlet orifice prior to combustion;

means for passing a constant total flow of air from said air plenum through said combustion air inlet orifice and said bleed air orifice; and

means for varying the proportions of air flowing through said orifices so as to vary the amount of air flowing to atmosphere and the amount of air mixing with combustion gas for combustion.

4,960,378

GAS BURNER

Theo Jannemann, Dorsten, and Hans Berg, Gladbeck, both of Fed. Rep. of Germany, assignors to Ruhrgas Aktiengesellschaft, Essen, Fed. Rep. of Germany

Filed Sep. 23, 1988, Ser. No. 248,531

Claims priority, application Fed. Rep. of Germany, Sep. 26, 1987, 3732482

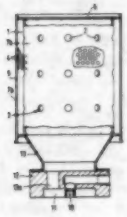
Int. Cl.[5] F23D *11/40*

U.S. Cl. 431—114 **20 Claims**

1. Gas burner of the type which uses a pressurized superstoichiometric mixture, comprising:

a partition wall (5) forming a flame supporting burner plate which is arranged between a combustion space and a

mixture space, the partition wall having openings (4) for the mixture, a throttle (1) which is arranged in the mixture space upstream of the partition wall, the throttle (1) defining at least one throttling opening (2) for decoupling the



combustion space from the mixture space as regards pulsations, wherein the sum of the cross-sectional area of each of said at least one throttling opening (2) is 2 to 10% of the sum of the cross-sectional area of each of said wall openings (4).

4,960,379

PROCESS AND APPARATUS FOR OPENING FURNACE TAPHOLES

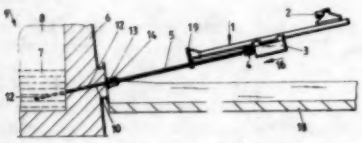
Werner Schneider, Siegen, Fed. Rep. of Germany, assignor to Dango & Dienenthal Maschinenbau GmbH

Filed Jan. 31, 1989, Ser. No. 304,661

Claims priority, application Fed. Rep. of Germany, Feb. 6, 1988, 3803625

Int. Cl.[5] F27D *1/16*

U.S. Cl. 432—3 **1 Claim**



1. A process for opening a furnace taphole that is closed by a body of plugging material and a previously positioned tapping rod, comprising the steps of:

driving the tapping rod completely through the taphole into the interior of the furnace; and

melting the rod down in the furnace by the heat of a liquid in the furnace.

4,960,380

METHOD AND APPARATUS FOR THE REDUCTION OF SOLID WASTE MATERIAL USING COHERENT RADIATION

Eric Cheetham, Cogan Station, Pa., assignor to Phoenix Environmental Ltd., Montgomery, Pa.

Filed Sep. 21, 1989, Ser. No. 410,560

Int. Cl.[5] F27B *3/20*; F23G *7/04*

U.S. Cl. 432—175 **8 Claims**

1. Apparatus for removing harmful constituents from the ash by-product of previously incinerated waste material, comprising:

a primary reaction chamber,

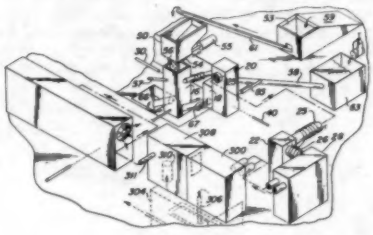
means for delivering said ash by-product to said primary reaction chamber,

a source of coherent radiation directed into said primary reaction chamber for heating said ash by-product within said reaction chamber to a molten state,

a secondary reaction chamber, said secondary reaction chamber being in open communication with said primary reaction chamber, reaction chamber,

means for delivering excitation waste into said secondary reaction chamber,

means for heating said excitation waste to a molten state,



means for conducting said molten excitation waste to said primary reaction chamber,

and means for treating the effluent resulting from converting said ash by-product and excitation waste to a molten state including means for reburning the effluent in said secondary reaction chamber.

4,960,381

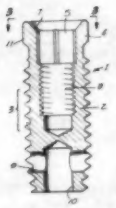
SCREW-TYPE DENTAL IMPLANT ANCHOR

Gerald A. Niznick, Encino, Calif., assignor to Core-Vent Corporation, Encino, Calif.

Continuation of Ser. No. 1,564, Jan. 8, 1987, abandoned. This application Aug. 10, 1988, Ser. No. 231,653

Int. Cl.[5] A61C *8/00*

U.S. Cl. 433—174 **44 Claims**



1. A screw-type dental implant anchoring means comprises an externally-threaded body portion joined to a top portion having an unthreaded exterior wall, said implant having an internal, wrench-engaging surface, and an internally-threaded shaft extending downwardly from said top portion into said body portion, said top portion having an outer circumference substantially no greater than the circumference of the externally-threaded body portion, said internal, wrench-engaging surface lying substantially entirely within said shaft, inside said body portion, substantially entirely within the exterior walls of said anchoring means, and substantially entirely below the upper surface of said anchoring means.

4,960,382

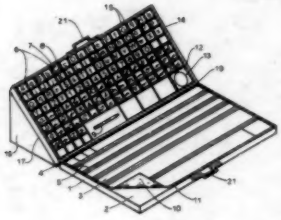
EDUCATIONAL WRITING BOARD KIT

Archie W. Alford, 1100 SE. 19th Ter., Gainesville, Fla. 32601

Filed Jan. 23, 1989, Ser. No. 299,672

Int. Cl.[5] G09B *11/04*; B43L *1/12*

U.S. Cl. 434—164 **11 Claims**



1. An educational writing board kit comprising:

a colored writing board with a smooth waxed surface;

a translucent plastic sheet with one edge attachable to one edge of the writing board;

parallel lines of fastening means on a front surface of the plastic sheet, said fastening means consisting of hook and loop fastening material;

rectangular templates having fastening means at edges of top and bottom surfaces in corresponding parallel relationship to the parallel lines of fastening means on the front surface of the plastic sheet, said fastening means consisting of hook and loop fastening material; and

a template container attachable in foldable relationship to the writing board.

4,960,383

DISPLAYBOARDS

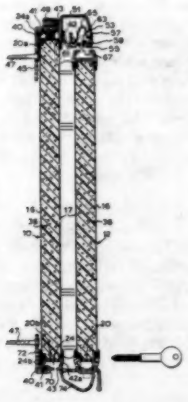
Brian D. Smith; Nigel T. Court, and Christopher G. Howsam, all of London, United Kingdom, assignors to International Tutor Machines, Limited, Hampshire, England

Filed Jan. 9, 1989, Ser. No. 294,419

Claims priority, application United Kingdom, Jan. 13, 1988, 8807008

Int. Cl.[5] G09B *1/06*

U.S. Cl. 434—430 **10 Claims**



1. A displayboard comprising two substantially coextensive spaced sheets formed with straight edges and each having appreciable tensile strength, core material separating and filling the space between said sheets, said core material having less tensile strength than said sheets and each said sheet being formed with lines of tongues projecting away from said core, the lines extending parallel to and comparatively close to edges of said sheet, and channel section edging strips shaped to fit over the edges of said sheets separated by said core material and formed with flanges engaging respectively outer faces presented by said two sheets and formed with recesses receiving said tongues, said recesses and said tongues being shaped mechanically to connect said edging strips with said sheets, upon filling said space between the said sheets with said core material.

4,960,384

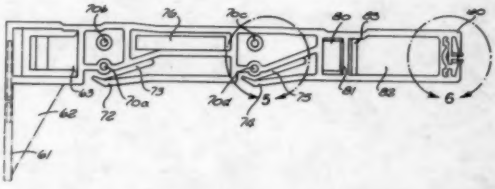
RETAINING MEANS FOR REMOVABLE COMPUTER DRIVE AND RELEASE MEANS FOR SAME

Richard Singer, Menlo Park, and Daniel Farmer, Mountain View, both of Calif., assignors to Silicon Graphics Inc., Mountain View, Calif.

Filed Sep. 18, 1989, Ser. No. 408,741

Int. Cl.[5] H01R *13/62*

U.S. Cl. 439—155 **3 Claims**



1. Means for retaining a drive system in a computer housing and releasing said drive system therefrom comprising:

drive mounting means disposed in said computer housing, said drive mounting means comprising track means and a rear mounting plate, said rear mounting plate having disposed therein electrical connector means and alignment pin receiving members;

bracket means attached to said drive system, said bracket means comprising side bracket means and rear bracket means, said side bracket means being attached to the sides of said drive system and being adapted to fit within said track means, and said rear bracket means having disposed therein electrical connector means adapted to mate with said electrical connector means of said rear mounting plate, and said rear bracket means further comprising alignment pins adapted to mate with said alignment pin receiving members, and whereby said rear bracket is movably attached to said drive system such that said rear bracket has limited freedom of movement to permit alignment of said electrical connector means thereof with said electrical connector means of said rear mounting plate, and said side bracket means further comprising a locking flange receiving means;

locking means for locking said drive system within said mounting means, said locking means comprising an elongated bar pivotably mounted on the exterior of said mounting means and having a front end and a back end, a flange means disposed on said back end, said flange means being disposed in the path of the drive system when said drive system is installed in said mounting means, said elongated bar having a locking flange extending inward toward said drive system and disposed between said front end and said back end, said locking flange being adapted to fit in said locking flange receiving means, and said elongated bar further having an angled surface disposed on said front end such that pressure applied to said angled surface causes the front end of said locking means to pivot away from said mounting means so that said locking flange is removed from said detent thereby unlocking said drive system from said mounting means;

release means comprising a sliding button adapted to engage said angled surface such that when said button is depressed, said locking means pivots, said locking flange is removed from said detent in said side bracket and said ejecting flange pivots forward to eject said drive system from said mounting means.

4,960,385

CATHODE-RAY TUBE SOCKET

Won-Tae Kim, Daegu, Rep. of Korea, assignor to Goldstar Co., Ltd., Seoul, Rep. of Korea

Continuation of Ser. No. 46,684, May 17, 1988, abandoned. This application Nov. 17, 1988, Ser. No. 273,619

Claims priority, application Rep. of Korea, May 9, 1986, 86-6318[U]

Int. Cl.[5] H01R *13/53*

U.S. Cl. 439—182 **3 Claims**

1. A cathode-ray tube socket comprising:

a terminal board including a plurality of radially extending grooves disposed therein, said terminal board further including a circular groove being deeper within the terminal board than said grooves and being provided with a plurality of first projecting members;

a cap cover for covering said terminal board, said cap cover including an outer ring and an inner ring disposed in a bottom portion thereof, and a plurality of recesses disposed in a circumferential portion thereof;

an electrical ground member disposed between said terminal board and said cap cover, said electrical ground member including a plurality of spark gaps arresting members; and

electrical connecting means, disposed within and between both said terminal board and said cap cover, for providing an elctrical path through the cathode-ray tube socket, whereby the cathode-ray tube socket provides effective overvoltage protection;

said outer ring including a plurality of second projecting members;

said inner ring including a plurality of third projecting members;

said outer and inner rings pressing said electrical connecting means into said radially extending grooves;

said electrical ground member further including a plurality of fourth projecting members disposed between said plurality of spark gaps, said plurality of fourth projecting members pressing said electrical ground member against said terminal board, thereby maintaining said spark gaps arresting members positioned around said first projecting members.

4,960,386

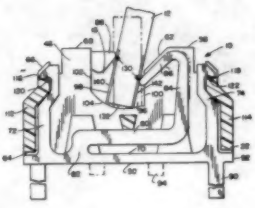
HIGH DEFLECTION, HIGH DENSITY SINGLE SIDED ELECTRICAL CONNECTOR

Kenneth W. Stanevich, New Baltimore, Mich., assignor to Molex Incorporated, Lisle, Ill.

Filed Oct. 17, 1989, Ser. No. 422,704

Int. Cl.[5] H01R *13/00*

U.S. Cl. 439—326 **9 Claims**



1. A low insertion force connector of the type for connecting a first circuit board to a second circuit board, the first circuit board having a board edge, first and second opposed board surfaces abutting the board edge, and at least one board contact on either the first or second opposed board surfaces, the connector comprising in combination:

A. a housing having spacing means for maintaining at least a first and a second contact space in the housing, the spacing means having a board cavity bounded by a first cavity side and an opposing second cavity side;

B. a first contact disposed in the first contact space and having only a first contact arm for engaging the first side of the circuit board and first means for supporting the first contact arm adjacent the first cavity side in the board cavity; and

C. a second contact disposed in the second contact space and having only a second contact arm for engaging the second side of the circuit board and second means for supporting the second contact are adjacent the second cavity side in the board cavity;

wherein (1) the first cantilevered beam extends across the width of the first housing cavity bounded by the first housing cavity's sides a first distance defined by the junction of said beam with a terminal support base and the furthest length said first beam can extend toward one of said housing cavity sides; and (2) the second cantilevered beam extends across the width of the second housing cavity bounded by the second housing cavity's sides a second distance defined by the junction of said beam with a terminal support base and the furthest length said second beam can extend toward one of said housing cavity sides; so that (3) the sum of said first distance and said second distance is greater than a distance between said opposite cavity walls either said cavity.

4,960,387

PIN SAVER

Wayne S. Davis, Harrisburg; Charles E. Reynolds, Mechanicsburg, and Robert N. Whiteman, Jr., Middletown, all of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Continuation of Ser. No. 303,108, Jan. 25, 1989, abandoned, which is a continuation of Ser. No. 90,295, Aug. 31, 1987, abandoned. This application Mar. 12, 1990, Ser. No. 494,783

Int. Cl.[5] H01R *13/629*

U.S. Cl. 439—374 **7 Claims**

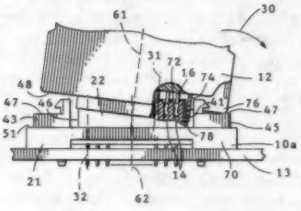
1. In an electrical connector assembly comprising:

a first laterally elongate connector having one or more receptacle contacts exposed along a mating face of a plug portion thereof, and further having a flange peripherally surrounding said plug portion and including a peripherally

surrounding forwardly facing surface rearward of said mating face; and

a second laterally elongate connector having one or more pin contacts extending forwardly of a forward face thereof, said one of more pin contacts being adapted to be received within said one or more receptacle contacts when said connectors are mated, and said second connector including a shroud surrounding said pin contacts adapted to receive thereinto said plug portion of said first connector and a wall peripherally surrounding said shroud and defining a peripherally surrounding forwardly facing surface rearward of the leading edge of said shroud; the improvement comprising:

at least one projection extending forwardly from said forwardly facing surface of at least one of said connectors and laterally outwardly of each end of said shroud when



said connectors are mated, said projection including a transverse surface positioned forwardly of said peripherally surrounding surface and facing the other of said connectors and adjacent a corresponding portion of said other connector

whereby if the connectors are mated or unmated in a manner tending to rotate the connectors relatively about an end of the assembly, the transverse surface of the at least one projection at that end of the assembly defines a primary fulcrum when engaged by the corresponding adjacent portion of the other connector tending to maintain the longitudinal axes of the contacts nearly parallel to one another without using vertical guide means until said pin contacts are substantially fully mated within or fully withdrawn from said receptacle contacts and thereby minimizing stress and resultant damage to the contacts and the connectors.

4,960,388

CIRCULAR CROSS SECTION DIN CONNECTOR AND DIN CONNECTOR ASSEMBLY

Robert H. Frantz, Newville; Benjamin H. Mosser, III, Middletown; Earl C. Myers, Jr., Harrisburg, and Charles E. Reynolds, Mechanicsburg, all of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Dec. 20, 1989, Ser. No. 453,534

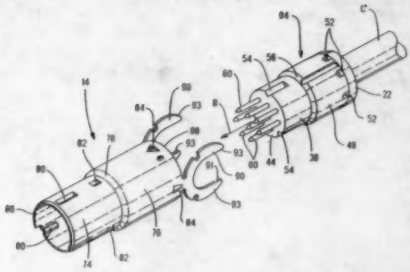
Int. Cl.[5] H01R *13/00*

U.S. Cl. 439—404 **14 Claims**

1. A circular cross section electrical connector assembly, comprising:

a tubular, insulating, wire housing defining a central through bore and having a first end formed with a ring of wire receiving notches opening thereinto, each notch having a base and a slot opening thereinto, said housing having a second end opposite to said first end and by way of which a plurality of insulated wires of a shielded electrical cable can be inserted through the bore each for reception in a respective one of said notches;

an insulating contact housing having a first end and a second end opposite thereto, a plurality of through cavities each opening into both of these ends, electrical contact elements secured in the cavities and each having a slotted, wire connection portion projecting from the first end of the contact housing and a mating portion at the other end thereof, the contact housing being matable with the wire housing to provide a sub-assembly in which each wire connecting portion is received in a respective slot of the wire housing to make permanent electrical connection with an insulated wire of said cable when said wire is received in a respective notch of the wire housing; and



a open ended tubular metal shielding shell for receiving the whole of said sub-assembly therewithin with the second end of said wire housing proximate to a first end of said shell, said shell having means crimpable over the second end of the wire housing to engage shielding on said cable and means for restraining movement of said assembly towards a second and opposite end of said shell.

4,960,389

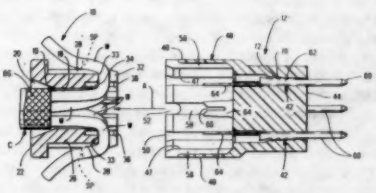
CIRCULAR DIN ELECTRICAL CONNECTOR

Robert H. Frantz, Newville; Benjamin H. Mosser, III, Middletown; Earl C. Myers, Jr., Harrisburg, and Charles E. Reynolds, Mechanicsburg, all of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Dec. 20, 1989, Ser. No. 454,610

Int. Cl.[5] H01R *13/00*

U.S. Cl. 439—404 **22 Claims**



1. A circular cross section electrical connector housing assembly comprising;

a wire housing having a first end and an opposite second end and defining a central bore opening into each of said ends, said first end having a series of notches opening thereinto in spaced relationship thereabout and each notch having a base into which opens a slot, said housing being formed with external parallel grooves each extending from said first end towards said second end and communicating with a respective one of said notches; and

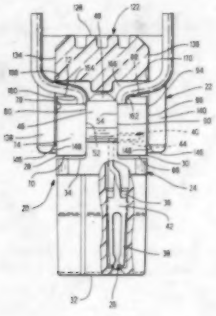
a contact housing for mating with said wire housing, and having an insulating body having a first end and a second end, a plurality of contact element receiving cavities each opening into such first and second ends, a hood surrounding said body projecting rectilinearly from the first end thereof for receiving said wire housing, the hood being formed with a series of internal parallel grooves opening into a free end of the hood and extending towards said first end of the body, each for cooperation with a corresponding external groove of said wire housing when it is received in said hood to provide a wire channel.

4,960,390

STRAIN RELIEF

Wayne S. Davis, Harrisburg; Michael E. Shirk, Grantville, and Robert N. Whiteman, Jr., Middletown, all of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Jan. 29, 1990, Ser. No. 471,319
Int. Cl.[5] H01R *13/58*
U.S. Cl. 439—459 23 Claims



1. A connector for terminating to a plurality of conductors, the connector comprising:

a housing having conductor terminating contacts secured therein, each of said contacts defining a longitudinal axis, and first and second terminating covers, said first and second terminating covers adapted to be secured to the housing from opposed directions transverse to the axes of the contacts in a terminating position in which the conductors are terminated to respective ones of the contacts with the terminated conductors extending rearwardly of the housing substantially parallel to said axes; and

one-piece strain relief means adapted to be secured to said housing by passing the strain relief means over at least a portion of said terminating covers in a direction parallel to said longitudinal axes, said strain relief means having a transverse member and a cover retention means, said transverse member adapted to intersect the rearwardly extending conductors when the strain relief means is secured to said housing when said housing is terminated to the conductors, and said transverse member adapted to cause the conductors to extend transverse to the longitudinal axes to pass laterally beyond the transverse member, said cover retention means extending from the transverse member proximate the terminating covers, said cover retention means for maintaining the termination covers in said terminating position.

4,960,391

HERMETICALLY SEALED ELECTRICAL BULKHEAD CONNECTOR

Ernest L. Beinhaur, Harrisburg, and Joseph G. Porter, Mechanicsburg, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Continuation of Ser. No. 366,987, Jun. 16, 1989, abandoned. This application Mar. 2, 1990, Ser. No. 490,527
Int. Cl.[5] H01R *13/533*
U.S. Cl. 439—559 2 Claims

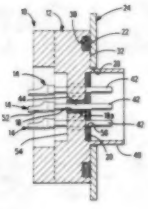
1. A housing for a non-circular hermetic bulkhead-mountable connector containing a plurality of electrical contacts extending in an elongate array through respective passageways from one side of a bulkhead to the other through a bulkhead cutout, the connector being of the type having a metal housing including a transverse metal contact support portion wherein the contacts are mountable during a very high temperature process within glass seals within the passageways for assured hermeticity, comprising:

a laterally elongate, one-piece metal housing member including a contact support section defining a mating face and a rearward face, a mounting section surrounding said contact support section and integral therewith, and a hood section extending forwardly from said contact support section and formed one-piece therewith to extend through said cutout and surrounding said mating face;

said contact support section being laterally elongate and including a plurality of passageways precisely axially therethrough to extend from said rearward face to said mating face within which said contacts are mountable within said glass seals in an elongate array and oriented precisely axially;

said mounting section defining a transverse, laterally elongate, forwardly facing bulkhead-engaging surface peripherally surrounding said hood section to engage corresponding surface portions of said bulkhead surrounding said cutout, said bulkhead-engaging surface including a gasket-receiving groove peripherally therearound to receive a compressible gasket member therein to be engaged by said corresponding bulkhead surface upon said housing being mounted to said bulkhead, said mounting section having an axial dimension substantially larger than the axial dimension of said contact support section and extending rearwardly of said rearward face of said contact support surface;

said mounting section further including flange sections at lateral ends thereof laterally of said hood section each



including aperture means extending thereinto from said bulkhead-engaging surface to receive mounting means threadedly thereinto for mounting said housing to said bulkhead;

said one-piece housing member being further defined in that said bulkhead-engaging surface is machined to be precisely coplanar, said contact support section is machined to have precisely planar and parallel rearward and mating faces, said passageways are precisely drilled after all other machining and finishing processes have been performed, and said member is free of impacting steps at least subsequent to machining of said surfaces,

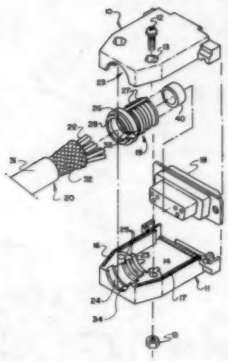
whereby the integral housing member is free of brazing or other joints which commonly provide sites for breaches in the hermetic seal during in-service use, and the thicker integral mounting section peripherally surrounding the elongate contact support section resists warping thereof during the very high temperature contact mounting process, and the forwardly extending integral hood section resists warping between the relatively massive rearwardly extending flange sections at lateral ends of the connector during the very high temperature contact mounting process, preserving the precise planarity of the contact support section and enabling and preserving precise axial alignment of the contacts and preserving the precise planarity of the bulkhead-engaging surface, thereby assuring the hermetic properties of the connector during in-service use.

4,960,392

SHIELDED CONNECTOR ASSEMBLY WITH NOISE SUPPRESSOR

Robert G. Dickie, 15 Valley Trail, R.R. #1, Newmarket, Ontario, Canada (L3Y4V8)

Filed Jan. 16, 1990, Ser. No. 465,700
Int. Cl.[5] H01R *13/66*
U.S. Cl. 439—620 10 Claims



1. A noise suppression system for electronic equipment, comprising

an electrical cable with an outer sheath surrounded by a conductive shielding, and

a ferrite cylinder having an insulated outer surface,

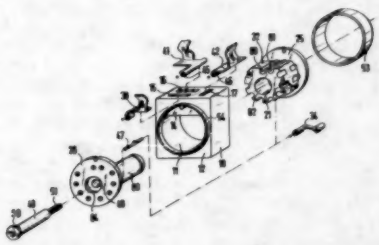
said ferrite cylinder being inserted between said outer sheath and said conductive shielding.

4,960,393

PLUG CONNECTING DEVICE FOR ELECTRICAL EQUIPMENT

Kurt Stoll, Lenzhalde 72, 7300 Esslingen, Fed. Rep. of Germany; Hans H. Glaettli, Seestr. 252, CH-8700 Kuesnacht, Switzerland, and Stanislav Zofka, Oberseestr. 81, Jona Bei Rapperswil/St. Gallen, Switzerland

Filed Jan. 19, 1989, Ser. No. 300,277
Claims priority, application Fed. Rep. of Germany, Jan. 21, 1988, 3801675
Int. Cl.[5] H01R *25/00*
U.S. Cl. 439—651 39 Claims



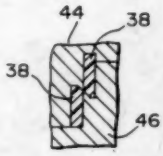
1. An apparatus comprising a plug connecting device for electrical equipment, said plug connecting device including: a housing, a plug contact arrangement which includes first and second plug contacts arranged on one side of the housing, and first and second groups of electrical plug connecting contacts arranged on respective portions of the housing, the plug connecting contacts of each said group being arranged in identical contact patterns, a first and a second of the plug connecting contacts of the first group having positions in the pattern respectively identical to positions in the pattern of a first and a second of the plug connecting contacts of the second group, the first plug connecting contact of the first group being connecting with the first plug contact the plug contact arrangement and the second plug connecting contact of the first group being connected with the second plug connecting contact of the second group and with the second plug contact, each of the plug connecting contacts of the first group other than the first and second plug connecting contacts thereof being electrically connected with a respective one of the plug connecting contacts of the second group other than the second plug connecting contact and located at a different position in the contact pattern so that the first plug connecting contact of the second group is connected to one of the plug connecting contacts of the first group other than the first and second plug connecting contacts thereof.

4,960,394

GROOMING RING AND GROOMING RING CARRIER

Robert J. Marks, Carpentersville, and Albert Kupferschmidt, Highland Park, both of Ill., assignors to Northern Telecom Limited, Montreal, Canada

Filed Aug. 23, 1989, Ser. No. 397,956
Int. Cl.[5] H01R *9/24*
U.S. Cl. 439—719 8 Claims



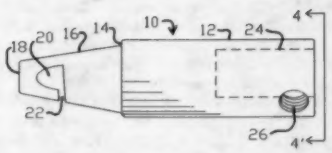
1. An integrally molded grooming ring and grooming ring carrier in which the carrier has one side surface with a longitudinally extending axis and the grooming ring projecting from the carrier outwardly beyond said side surface and extends laterally of the side surface to define a grooming space having an axis extending longitudinally of the side surface, the grooming ring being resiliently flexible from a normal relaxed state to widen a gap for passage therethrough of conductors into the grooming space, and, in the normal relaxed state, the grooming ring being displaced axially of the side surface as it extends around the grooming space to enable all surfaces of the grooming ring, at any position along those surfaces, to be free of obstruction in at least one direction across the side surface and normal to its longitudinal axis.

4,960,395

CONICAL TWIST-LOCK ELECTRICAL CONNECTOR

Richard P. Ushler, 11346 Farlin St., Los Angeles, Calif. 90049

Filed Jun. 19, 1989, Ser. No. 367,983
Int. Cl.[5] H01R *4/50*
U.S. Cl. 439—864 7 Claims



7. An improved locking system in a readily disconnectable electrical connector pair of the type in which a tapered extension of a plug member matingly contacts a complementary

shaped cavity region of a socket member over an interfacing surface having generally a truncated conical shape, the improved locking system comprising;

a cylindrical metallic pin, incorporated in the socket member, defining within the cavity a protrusion, disposed chordally relative to a circular cross section of the cavity so as to co-operate in threaded engagement with a thread groove of U-shaped cross section recessed in the plug member extension, in a manner enabling removable securing together of the pair in a twist-lock mode;

the thread groove and an associated lead-in shelf being located entirely within a central region of the interfacing surface, substantially distanced from boundaries of the interfacing surface; whereby the plug member is made to have a fully circular cross sectional shape in an end region thereof, and is thus enabled to fully and uniformly contact a corresponding region of the socket member cavity.

4,960,396

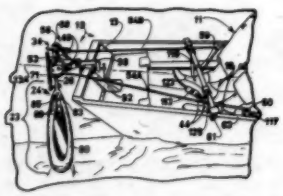
FOOT-OPERATED BOAT PADDLE PROPULSION SYSTEM

Lawerence Stolzer, 11409 Jamestown Dr., Little Rock, Ark. 72211

Continuation-in-part of Ser. No. 145,386, Jan. 19, 1988, abandoned. This application Sep. 28, 1989, Ser. No. 413,600

Int. Cl.[5] B63H *16/00*

U.S. Cl. 440—21 **13 Claims**



1. A boat propulsion system for foot operation by a fisherman to maneuver a boat through a body of water, said boat having a longitudinal axis, said propulsion system comprising:

mounting means for securing said propulsion system upon a portion of said boat;

paddle means extending into the water for propelling said boat through said body of water;

foot-powered pedal means for actuating said paddle means from a position within the boat;

cable means interconnecting said pedal means with said paddle means for operating same cam means for releasably operatively mounting said paddle means to said mounting means;

means for facilitating torsional rotation of said paddle means relative to said cam means to reverse the pitch of said paddle means in initial response to differential cable tension thereby effectuating a first motion twisting said paddle means to achieve a proper pitch;

donut means for operatively coupling said cable means to said paddle means, said donut means deflectable between forward and reverse positions to reverse the direction of paddle rotation in response to torsional forces;

means for facilitating rotation of said paddle means relative to said boat in response to differential cable tension to facilitate a second motion wherein said paddle means is periodically arced through the water in a plane generally perpendicular to the longitudinal axis of said boat to effectuate propulsion; and,

said mounting means, said cam means displaceable from a normally fixed position in response to contact of said paddle means with an underwater obstacle to effectuate a third motion allowing said paddle means to move in an arc occupying a plane substantially coincident with or parallel to said boat longitudinal axis.

4,960,397

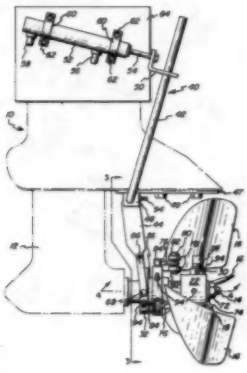
VARIABLE PITCH PROPELLER ASSEMBLY

Robert F. Suttmeier, Box 77, Vernal Butler Rd., Purling, N.Y. 12470

Filed Aug. 5, 1988, Ser. No. 228,453

Int. Cl.[5] B63H *3/00*

U.S. Cl. 440—050 **16 Claims**



1. A variable pitch propeller assembly for mounting on a propeller drive shaft, said propeller assembly comprising:

a hollow casing having inner and outer surfaces, said inner surface being disposed so as to fit securely around at least a portion of the outer surface of said propeller shaft and so as to rotate therewith, and said outer surface being disposed so as to form the general shape of a cylinder, with the longitudinal axis of said cylinder being defined by the axis of rotation of said propeller shaft;

a hollow collar disposed about the longitudinal axis of said cylindrically shaped casing so as to synchronously rotate about said axis with rotation of said casing, said collar being further configured so as to be movable with respect to said casing along said axis of rotation, said collar being connected to said casing by a cam and groove assembly which restrains said collar from rotational movement with respect to said casing, about said axis of rotation of said casing, while simultaneously allowing movement between said collar and said casing in a direction along the length of said axis;

means for moving said collar with respect to said casing along said axis of rotation;

a plurality of propeller blades arranged in a spaced-apart relationship about the outer circumference of said casing, each said blade being connected to said casing so as to be rotatable about an axis which extends generally perpendicularly from the outer surface of said casing at the location where said blade is connected to said casing, each said blade being further disposed so that rotational movement of said blade about said perpendicular axis changes the pitch of said blade with respect to said axis of rotation of said casing; and

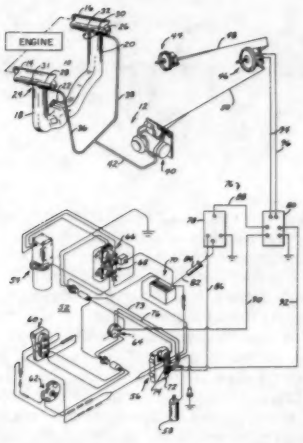
means for connecting said collar to each of said propeller blades at a location on each said blade which is, with respect to said axis of rotation of said casing, radially outward of the outer surface of said casing, said connecting means being further disposed so that said axial movement of said collar with respect to said casing produces, for each said blade, the same amount of rotational movement about the blade's perpendicular axis.

4,960,398

STERN DRIVE MARINE PROPULSION SYSTEM WITH AUTOMATIC TRIM CONTROL AND EXHAUST CONTROL

Douglas R. Potratz, Oshkosh, Wis., assignor to Brunswick Corporation, Skokie, Ill.

Filed Dec. 28, 1988, Ser. No. 291,145
Int. Cl.[5] B63H *21/32*
U.S. Cl. 440—53 **10 Claims**



10. A method of adjusting the power output of a marine propulsion system including an engine; an exhaust discharge system for discharging exhaust from said engine, said exhaust system including an above-water exhaust discharge outlet and a below-water exhaust discharge outlet; and a trimmable drive unit drivingly interconnected with said engine, comprising the steps of:

providing an exhaust control means for controlling discharge of exhaust through said above-water outlet and said below-water outlet;

providing an automatic trimming means for trimming said trimmable drive unit in response to one or more preselected operating conditions of said marine propulsion system; and

interconnecting said exhaust control means with said automatic trimming means so that said exhaust control means is responsive to actuation of said automatic trimming means.

4,960,399

DIVER'S UTILITY CONSOLE

Richard A. Lyon, 4108 Hidden Canyon Cove, Austin, Tex. 78746

Filed Jul. 14, 1988, Ser. No. 219,332
Int. Cl.[5] B63C *11/02*
U.S. Cl. 441—136 **13 Claims**

1. A hand-portable divers' utility console comprising:

(a) a housing defining at least a water-vented compartment having a removable, forward closure for alternately storing things or mounting an external illumination means when the closure is removed,

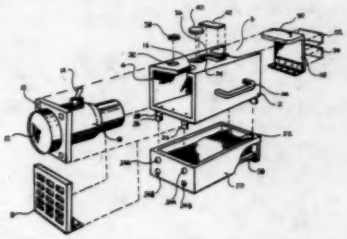
(b) a diver's bag device comprising:

(i) a flexible, water-vented sack means, said means being collapsible into a folded state,

(ii) a framework means defining an open-face enclosure having a rim for containing therein the sack means in its collapsed state, the sack means being affixed to the framework in a way that whenever the open face of the enclosure is facing generally downward, the force of gravity will tend to un-collapse the sack means and distend it,

(iii) means for applying a gripping force to the framework in a direction which would oppose any force exerted on the framework by the sack means or its contents,

(iv) a closeable port defined by the sack means for taking things in and out the sack means, and



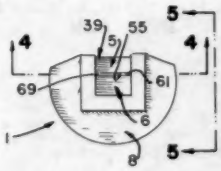
(c) means for latching the open face of the enclosure against a surface of the housing whenever the sack means is collapsed therein, said surface of the housing substantially closing the enclosure in order to contain the sack means.

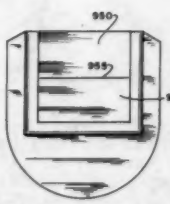
4,960,400

GAME CALL

Gary L. Cooper, HC-04, Box 62, Pocahontas, Ark. 72455

Filed Nov. 17, 1989, Ser. No. 437,586
Int. Cl.[5] A63H *5/00*
U.S. Cl. 446—207 **9 Claims**





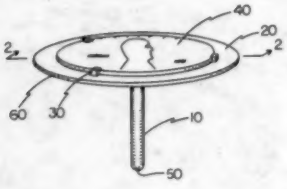
1. A game call comprising a plurality of generally elongatedly rectangular, planar, thin, flexible diaphragms secured at opposite short edges thereof in a frame, said diaphragms lying adjacent one another in substantially the same plane, said diaphragms having trailing and leading long edges, the leading edge of successive diaphragms being spaced from the trailing edge of the immediately adjacent diaphragm.

4,960,401

SPINNING TOP TOY

Bruce Ross, 8 Kiska Ct., Randallstown, Md. 21133

Filed Dec. 14, 1989, Ser. No. 450,563
Int. Cl.[5] A63H *1/00*
U.S. Cl. 446—256 2 Claims



1. A lightweight spinning top structure, comprising:

a spindle means, having a pivot point at one end, for spinning said spinning top structure with the fingers of one hand and,

mounting means, attached to said spindle means for removably holding, supporting, orienting and aligning a coin, whereby the axis of symmetry of said coin is aligned with the axis of rotation of said spindle means,

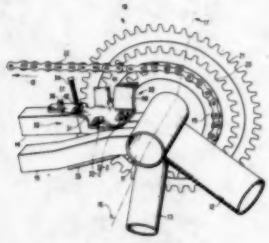
whereby the synergism of combining said lightweight spinning top structure and said coin provides the ability for the combination to spin in a prolonged stable manner.

4,960,402

ANTI-CHAIN WRAP DEVICE FOR BICYCLES

Gary G. Klein, Chehalis, Wash., and Tye T. Gribb, Madison, Wis., assignors to Klein Bicycle Corporation, Chehalis, Wash.

Filed Sep. 27, 1989, Ser. No. 412,823
Int. Cl.[5] F16H *7/18*
U.S. Cl. 474—80 20 Claims



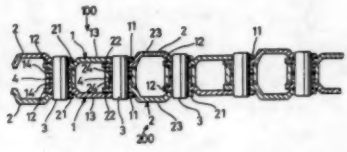
1. An anti-chain wrap device for a chainring drive system of a bicycle in which there are a plurality of chainrings of varying diameters and teeth rotatably mounted in the bottom bracket of said bicycle, a set of rear sprocket wheels mounted on the rear wheel, one of a pair of chainstays extending rearwardly of said bottom bracket, and a rear derailleur having a tension arm for maintaining chain tension, comprising means for mounting said anti-chain wrap device on said bicycle adjacent the rotary path of said chainrings, and a plurality of lifters, there being a lifter for each chainring and the lifters for the smaller of said chainrings extending in a downward curved direction to a point adjacent the rotary path of its associated chainring, respectively.

4,960,403

BICYCLE DRIVE CHAIN

Masashi Nagano, Osaka, Japan, assignor to Shimano Industrial Co., Ltd., Osaka, Japan

Filed Jul. 28, 1989, Ser. No. 386,180
Claims priority, application Japan, Aug. 3, 1988, 63-193778
Int. Cl.[5] F16G *13/06*
U.S. Cl. 474—213 8 Claims



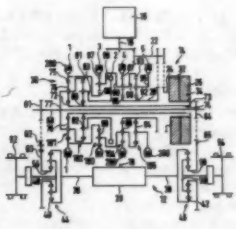
1. A bicycle drive chain having a plurality of alternately connected first and second plates each formed of a pair of members having substantially uniform thickness over their length and having first and second connecting portions at opposed ends thereof, with the second connecting portion of one plate being fitted inwardly of the first connecting portion of the other plate, wherein an entire side face of said first connecting portion is deformed outwardly in a transverse direction of the chain relative to said second connecting portion, said first and second connecting portions being interconnected with each other via respective middle portions, at least one vertical end of said middle portion of the first plate being formed flush with or outwardly in the chain transverse direction relative to said first connecting portion, at least one vertical end of said middle portion of the second plate being formed outwardly in the chain transverse direction relative to said first connecting portion.

4,960,404

SUPERPOSITION STEERING SYSTEM WITH INTEGRATED MECHANICAL AND INFINITELY VARIABLE DRIVES

Rudi Reppert, Fussen, and Franz-Xaver Zaunberger, Augsburg, both of Fed. Rep. of Germany, assignors to Renk Aktiengesellschaft, Augsburg, Fed. Rep. of Germany

Filed Sep. 22, 1989, Ser. No. 411,096
Claims priority, application Fed. Rep. of Germany, Sep. 24, 1988, 3832529
Int. Cl.[5] F16H *37/06*
U.S. Cl. 475—23 10 Claims



1. In a superposition steering system for a tracked vehicle having a pair of summation planetary gears for driving vehicle tracks with the summation planetary gears being driven by a propulsion drive, the steering system including:

(a) a neutral shaft interconnected to the summation planetary gears for superimposing steering control, the steering system further including

(b) a continuously variable steering drive input unit having an output element with continuously variable rotational speed,

(c) a mechanical steering input drive, and

(d) a steering transmission for integrating the continuously variable steering input drive with the mechanical steering input drive, the steering transmission being shiftable under load without power interruption between a plurality of operating stages, the steering transmission comprising

(i) a first epicyclic differential gear having a sun gear connected with the output element of the continuously variable steering input drive unit, a plurality of planet gears, a planet carrier, and a ring gear, the planet carrier comprising an output element of the steering transmission and being connected to the neutral shaft,

(ii) first shift coupling means interconnected with the ring gear of the first epicyclic differential gear for selectively blocking ring gear rotation,

(iii) a second epicyclic differential gear, the second gear having a sun gear connected with the output element of the variable steering input drive, the second epicyclic differential gear including a plurality of planet gears and a planet carrier, the second gear further including a ring gear, the ring gear being connected with the planet carrier of the first epicyclic differential gear,

(iv) a fourth epicyclic differential gear, the fourth gear having a sun gear connected to the mechanical steering input drive, a plurality of planet gears, a planet carrier and a ring gear,

(v) fourth shift coupling means for selectively blocking rotation of the ring gear of the fourth epicyclic differential gear,

(vi) a fifth epicyclic differential gear, the fifth gear including a sun gear connected with the mechanical steering input drive, a plurality of planet gears, a planet carrier and a ring gear,

(vii) fifth shift coupling means for selectively blocking the planet carrier of the fifth gear,

(e) the improvement comprising:

(i) a third epicyclic differential gear, the third gear including a sun gear connected with the ring gear of the first epicyclic differential gear, the third epicyclic differential gear further including a plurality of planet gears, a planet carrier and a ring gear,

(ii) the third epicyclic differential gear planet carrier being connected with the planet carrier of the fourth epicyclic differential gear,

(iii) third shift coupling means for selectively blocking the ring gear of the third epicyclic differential gear and

(iv) second shift coupling means for selectively connecting the planet carrier of the second epicyclic differential gear with the planet carriers of the third epicyclic differential gear and the fourth epicyclic differential gear.

4,960,405

TRACTION DRIVE SPINDLE DEVICE

Eiichi Katayama; Kouichi Ueda; Hiroaki Takebayashi, and Kazuo Rokkaku, all of Osaka, Japan, assignors to Koyo Seiko Co., Ltd. and Showa Tool Co., Ltd., both of Osaka, Japan

Filed May 30, 1989, Ser. No. 358,093

Claims priority, application Japan, Jun. 8, 1988, 63-141395

Int. Cl.[5] F16H *13/06;* **B23B** *39/10*

U.S. Cl. 475—183 **11 Claims**

1. A traction drive spindle device, comprising:

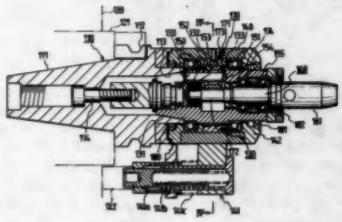
a generally tubular housing having a central axis, front and rear openings, and a rotation preventing means for preventing said housing from rotating relative to a machine body;

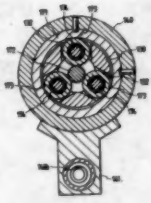
a ring fixedly secured to an inner periphery of said housing, said ring having an inner peripheral surface;

a holder shaft, having an outer peripheral surface, rotatably supported in said housing in radially spaced coaxial relationship to said ring, said holder shaft having front, center, and rear portions, said front and rear portions extending exteriorly of said respective front and rear openings in said housing, said holder shaft having a central bore penetrating the front portion and extending to a point intermediate said center and rear portions, and a plurality of circumferentially spaced apertures communicating between the outer peripheral surface and the central bore;

a spindle rotatably supported in the central bore of said holder shaft, said spindle having front and rear end portions;

means for mounting a tool connected to the front end portion of said spindle and extending exteriorly of said central bore;





a roller shaft having an outer peripheral surface, connected to the rear end of said spindle, rotatably supported in the central bore of said holder shaft in the vicinity of said apertures;

a rotatable input shaft connected to the rear portion of said holder shaft; and

a plurality of planetary rollers rotatably mounted on pins extending from the holder shaft, having peripheral surfaces extending radially from said pins into the circumferentially spaced apertures in said holder shaft, and disposed in sliding contact between the inner peripheral surface of said ring and the outer peripheral surface of said roller shaft.

4,960,406

CENTRIFUGE

Boris P. Gorodissky, Leninsky prospekt, 154, kv. 201., and Alexandr I. Sambursky, ulitsa 1, Susanina, 6, Korpus 4, kv. 10., both of Moscow, U.S.S.R.

Filed Jul. 17, 1989, Ser. No. 380,902

Claims priority, application U.S.S.R., Jul. 18, 1988, 4447753

Int. Cl.[5] B04B *13/00*

U.S. Cl. 494—9 **6 Claims**

1. A centrifuge comprising:

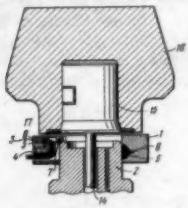
a drive having a casing with a mounting surface having a radius of curvature;

a centrifuge rotor rotated by said drive and having a lower surface and a marked disc on the lower surface;

a ring installed on said mounting surface of said casing of said drive and having a recess and a hole with an axis;

a mounting plate secured immovably in said recess of said ring;

a rotor speed sensor installed on said mounting plate and being movable relative to said lower surface of said rotor to a position of optimum sensitivity to its rotation speed;



a movable element accommodated in said hole and installed therein, said movable element touching said radius of curvature of said mounting surface of said casing of said drive and allowing movement of said ring relative to said lower surface of said rotor for setting said sensor at a certain distance from said surface for optimum sensitivity to the rotation speed of the rotor.

4,960,407

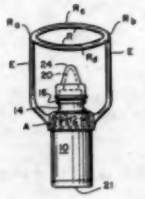
DISPOSABLE EYE DROP DISPENSER INSTRUMENT FOR POST-SURGICAL AND GENERAL USE

Samuel M. Cope, 265 Western Promenade, Portland, Me. 04102

Continuation-in-part of Ser. No. 129,987, Dec. 8, 1987, Pat. No. 4,834,727. This application May 26, 1989, Ser. No. 357,485

Int. Cl.[5] A61M *35/00*

U.S. Cl. 604—300 **9 Claims**



1. An instrument for delivery of drops of liquid eye drop solution into the eye of a patient for post-surgical and general treatment, said instrument comprising:

a squeeze-type dispenser bottle comprising a body defining a volume for eye drop solution, said body having a neck and shoulder region and a base, and having a nozzle disposed above said neck and shoulder region and defining an orifice for delivery of solution from said volume, and

a device for positioning said nozzle relative to an eye of a patient to be treated, said device comprising

a generally oval ring contoured to fit the intraorbital or periorbital area of a patient's body,

at least one post extending from said oval ring generally perpendicular to a plane of said oval ring, said post comprising a main section having a first end joined to said oval ring and a second end, and a stub post element disposed to extend between said second end and an apron member, said stub post element extending generally perpendicular to the axis of said main post section, and

means for attachment of said post in the region of said shoulder and upper part of the body of said bottle comprising

said apron member sized and constructed for fixed engagement upon said body, encircling said nozzle, and comprising a first apron portion adapted to engage upon said bottle generally in said shoulder region and defining an opening for passage over said nozzle and said neck, and said apron member further comprising a second apron portion depending from said first apron portion to extend about the body of the bottle in a region more remote from said neck.

4,960,408

TREATMENT METHODS AND VACCINES FOR STIMULATING AN IMMUNOLOGICAL RESPONSE AGAINST RETROVIRUSES

Albert S. Klainer, 315 W. 70th St., New York, N.Y. 10023, and Emil Bisaccia, 4 Sunnybrook Rd., Basking Ridge, N.J. 07920

Filed Jan. 10, 1989, Ser. No. 295,454

Int. Cl.[5] A61M *37/00*; A61N *1/30*; A61K *41/00*

U.S. Cl. 604—4 **21 Claims**

1. A method for treating a patient having an HIV retrovirus infection, said method comprising the steps of:

a. administering to an infected patient's blood a psoralen compound; and

b. treating at least a portion of the patient's blood to which the psoralen compound has been administered, said treatment comprising subjecting the portion of blood to photopheresis using electro-magnetic radiation of a spectrum which activates the psoralen compound, whereby the activated psoralen compound reacts with the HIV retrovirus and/or HIV retrovirus infected cells in the portion of blood undergoing photopheresis, the psoralen compound and electro-magnetic radiation being administered in doses which are effective for controlling the infection.

4,960,409

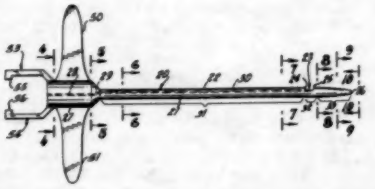
METHOD OF USING BILUMEN PERIPHERAL VENOUS CATHETER WITH ADAPTER

Marc L. Catalano, 2501 Bahama Dr., Miramar, Fla. 33023

Division of Ser. No. 906,138, Sep. 11, 1986, Pat. No. 4,776,841. This application Oct. 5, 1988, Ser. No. 253,618

Int. Cl.[5] A61M *5/00*

U.S. Cl. 604—53 **11 Claims**



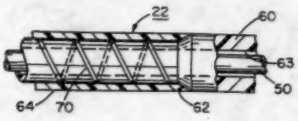
1. A method of simultaneously injecting two non-compatible fluids into a peripheral portion of the body of a patient consisting essentially of inserting a bilumen peripheral venous catheter into said peripheral portion of said body of said patient, said catheter having two lumens of different cross-section within a peripheral wall of said catheter, applying a flow of one of said fluids to one of said lumens having a relatively small cross-section for delivery into said body at a proximal opening along the wall of said catheter and simultaneously applying a flow of the other of said fluids to the other of said lumens having a relatively large cross-section not exceeding 18 gauge for delivery into said body at a distal opening at the end of said catheter.

4,960,410

FLEXIBLE TUBULAR MEMBER FOR CATHETER CONSTRUCTION

Leonard Pinchuk, Miami, Fla., assignor to Cordis Corporation, Miami, Fla.

Filed Mar. 31, 1989, Ser. No. 332,503
Int. Cl.[5] A61N *25/10*
U.S. Cl. 604—96 **12 Claims**



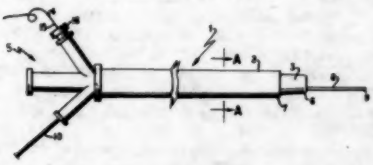
1. A catheter for insertion into a subject comprising an elongated tubular member which extends from a proximal end to a distal end of said catheter and defines a passageway extending through said catheter from the proximal end to the distal end; said elongated tubular member including a first relatively stiff tube that is spirally cut along a distal portion to increase its flexibility and, includes an inner surface that defines said passageway and a second more flexible tube that covers the spirally cut distal portion of the stiff tube to make a distal portion of the elongated tubular member more flexible than a proximal portion of the elongated tubular member.

4,960,411

LOW PROFILE STERRABLE SOFT-TIP CATHETER

Maurice Buchbinder, San Diego, Calif., assignor to Medtronic Versaflex, Inc., San Diego, Calif.

Continuation-in-part of Ser. No. 65,122, Jun. 18, 1987, abandoned, which is a continuation of Ser. No. 774,345, Sep. 10, 1985, abandoned, which is a continuation-in-part of Ser. No. 651,806, Sep. 18, 1984, abandoned. This application Jun. 30, 1988, Ser. No. 213,662
Int. Cl.[5] A61M *29/02, 25/01*
U.S. Cl. 604—95 **43 Claims**



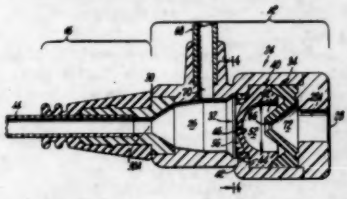
1. A steerable catheter means comprising:
an outer catheter shaft,
a flexible catheter member located within said outer catheter shaft having distal and proximal ends and one or more lumens extending therethrough, at least one of said lumens being closed at its distal end, the other lumen or lumens being open at the distal end or ends thereof,
a deflection were having distal and proximal ends and axially extending through a lumen having a closed end, the distal end of said deflection wire being embedded in said closed end, and
control means attached to the proximal end of said catheter member, the proximal end of said deflection wire extending through said control means and said control means having an engaging means which fixedly engages said deflection wire, rotation of said engaging means causing said deflection wire to longitudinally displace either toward or away from the distal end thereof, said displacement causing the distal end of said catheter member to bend out of or toward the line of he longitudinal axis of said catheter member, and the engaging means of said control means fixedly engaging said deflection wire so that when said control means is rotated, said catheter member and said deflection wire both rotate together to cause the distal end of said catheter member to rotate about its longitudinal axis.

4,960,412

CATHETER INTRODUCING SYSTEM

E. David Fink, Schnectady, N.Y., assignor to Universal Medical Instrument Corp., Ballston Spa, N.Y.

Filed Apr. 15, 1988, Ser. No. 182,138
Int. Cl.[5] A61M *5/18*
U.S. Cl. 604—167 **11 Claims**



1. A catheter introducing valve assembly of a catheter introducer including a sheath tube positioning a catheter tube in a blood vessel of a patient, comprising in combination,
a valve assembly including a central passage having opposed inlet and outlet ends, said valve assembly for positioning the catheter tube which is introduced into said valve assembly at said inlet end;
first valve means bearing sealing lips of flexible, resilient material positioned internally across said passage in said valve assembly for sealing off flow of blood during any time the catheter tube is absent from the catheter introducer,
second valve means positioned externally across said passage in said valve assembly and comprising gasket means with an aperture adapted to the diameter of the sheath tube for sealing off flow of blood during the time the catheter tube is positioned in the catheter introducer,
holding means connected to said first valve means and adapted to said valve assembly for keeping said first valve means in a sealed position when the catheter tube is absent,
connector means mounted to said valve assembly at said outlet end for securing the sheath tube to said valve assembly;
said first valve means comprising a first valve body made of a flexible, resilient material, and including a reinforced valve disk having a centrally positioned valve slit extending transversely to said central passage, said valve slit having opposed valve lips; and said holding means being positioned transversely to said valve slit so as to keep said valve lips together when the catheter tube is absent from the catheter introducer and to close said valve lips during withdrawal of the catheter tube;
and said valve assembly further including a generally cylindrical assembly body having a generally cylindrical compartment area in axial alignment with a central passage having an inner surface, said compartment area having a first diameter; said reinforced valve disk having a cylindrical disk rim of a second diameter, said second diameter being slightly less than said first diameter, wherein a cylindrical space is defined between said disk rim and said inner surface of said compartment area; and wherein said holding means includes a pair of diametrically opposed peripheral bosses connected to said disk rim and positioned transversely to said valve slit, said bosses having curved ends conforming to the configuration of and in tight

contact with said inner surface of said compartment area, whereby even pressure is exerted against said valve lips, the lips are held together in sealing relationship during the absence of the catheter tube from the catheter tube assembly.

4,960,413

WOUND DRESSING

Brian Sagar, Cheadle; Paul Hamlyn, East Didsbury, and David Wales, Reddish, all of England, assignors to The Shirley Institute, Manchester, England

Continuation of Ser. No. 51,454, May 19, 1987, abandoned. This application Feb. 13, 1989, Ser. No. 309,971

Int. Cl.[5] A61M *35/00*

U.S. Cl. 604—289 **13 Claims**

1. A wound dressing comprising an assembly of microfungal fibers which have been treated with alkali to dissolve protein from the outer layers of the cell walls and expose chitin and chitosan.

4,960,414

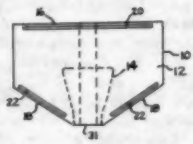
TRAINING PANTS

Sandra L. Meyer, 2227 W. Dayton Ave., Fresno, Calif. 93705

Filed Sep. 18, 1989, Ser. No. 408,226

Int. Cl.[5] A61F *13/16*

U.S. Cl. 604—395 **1 Claim**



1. A child's disposable biodegradable training pants comprising an outer paper sheet, an inner paper liner, and a plural number of elastic strips attached to upper and lower edge areas of said outer sheet;

said outer sheet having an imaginary vertical centerline (**24**); said outer sheet including a central panel (**26**) centered on said vertical centerline, and two side panels (**28**) extending laterally from said central panel; said central panel and said side panels having a common upper edge (**30**) extending normal to the vertical center line, said side panels having outer edge areas (**35**) extending parallel to the vertical centerline;

said central panel having a straight lower central edge (**31**) extending generally normal to the vertical centerline, and generally straight outboard edges (**32**) angling outwardly and upwardly from said central edge; each side panel having a generally straight lower inboard edge (**33**) that angles downwardly and outwardly from the central panel, and an outboard edge that is generally normal to the vertical centerline;

said elastic strips comprising individual elastic strips extending along said outboard edges of the central panel and said inboard edges of the side panels;

said paper liner having an hour glass configuration that forms a relatively narrow central neck area (**38**) adapted to extend long the lower central edge of the central panel when the liner is attached to the inner surface of the outer sheet;

said outer edge areas (**35**) of the side panels being adhesively secured together; said paper liner being adhesively secured along its perimeter edge to the central panel and the side panels.

4,960,415

DEVICE FOR INSERTING IN WOUNDS AND WOUND CAVITIES

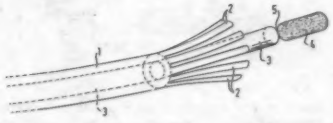
Johannes Reinmüller, Ulm, Fed. Rep. of Germany, assignor to Merck Patent GmbH, Darmstadt, Fed. Rep. of Germany

Continuation of Ser. No. 878,842, Jun. 11, 1986, abandoned. This application Nov. 18, 1988, Ser. No. 274,647

Claims priority, application Fed. Rep. of Germany, Sep. 6, 1984, 3432825; Feb. 22, 1985, 3506288

Int. Cl.[5] A61F *5/46;* **A61M** *25/00*

U.S. Cl. 604—890.1 **14 Claims**



12. A device for inserting in wounds and wound cavities, comprising a container containing a solid precursor being able to form a pharmaceutically active substance by a chemical or enzymatic reaction, said container having walls formed, at least partially, of a membrane which allows said pharmaceutically active substance and/or said precursor to escape into the wound area, said precursor having a low water solubility and being in the form of particles, said membrane comprising pores which are small enough to retain the particles within but do not restrict ingress of external body fluids, wherein the release of the pharmaceutically active substance and/or said precursor into the external body fluids is limited largely by water solubility; and a tubular wound drainage device connected to said container for draining away wound secretions from wounds and wound cavities wherein the tubular wound drainage device has an end for insertion in the body and said end is split into several filaments to facilitate wound drainage.

4,960,416

DOSAGE FORM WITH IMPROVED DELIVERY CAPABILITY

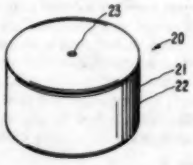
Sally I. Stephens, Mountain View, and Patrick S. L. Wong, Hayward, both of Calif., assignors to ALZA Corporation, Palo Alto, Calif.

Continuation of Ser. No. 153,306, Feb. 8, 1988, Pat. No. 4,863,456, which is a continuation of Ser. No. 857,265, Apr. 30, 1986, abandoned. This application Jul. 10, 1989, Ser. No. 377,647

The portion of the term of this patent subsequent to Sep. 5, 2006, has been disclaimed.

Int. Cl.[5] A61K *4/22*

U.S. Cl. 604—892.1 **7 Claims**



1. A dosage form for delivering a beneficial agent to a fluid environment of use, comprising:

(a) a wall comprising in at least a part a semipermeable composition permeable to the passage of an exterior aqueous fluid and substantially impermeable to the passage of a beneficial agent, which wall surrounds and forms:

(b) a compartment;

(c) a first layer comprising a beneficial agent in the compart-

ment, which layer forms in situ a dispensable aqueous formulation with fluid that enters the compartment;

(d) a third layer comprising means for expanding and occupying space in the presence of fluid in the compartment;

(e) a second layer interposed between the first and third layer in the compartment, said second layer a separate and distinct layer comprising a different composition than the first and third layers, which second layer comprises a non-expandable hydrophobic composition that is a means for substantially preventing the migration of the beneficial agent from the first layer comprising the dispensable aqueous formulation into the third layer; and,

(f) means in the wall connecting the exterior of the dosage form with the compartment, said means for connecting the exterior of the dosage form with the interior compartment comprising a microporous member.

4,960,417

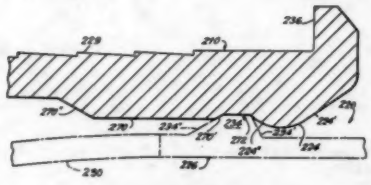
COMPACT TAMPON APPLICATOR WITH IMPROVED INTERLOCK

Warren T. Tarr, Jr., Turners Falls, and Irl R. Sanders, III, Wilbraham, both of Mass., assignors to Tambrands, Inc., Lake Success, N.Y.

Continuation-in-part of Ser. No. 60,832, Jun. 12, 1987, Pat. No. 4,846,802, and Ser. No. 68,994, Jun. 19, 1987, abandoned, which is a continuation of Ser. No. 879,140, Jun. 26, 1986, Pat. No. 4,726,805. This application Jul. 18, 1988, Ser. No. 220,164

Int. Cl.[5] A61F *15/00*

U.S. Cl. 604—15 **22 Claims**



1. A catamenial tampon applicator comprising:

an ejector tube;

an outer tube dimensioned to fit closely and telescopically over said ejector tube and having a distal discharge end;

restraining means between said tubes for preventing the disassembly of said ejector tube from said outer tube in the proximal direction, comprising:

a circumferentially-extending raised rib structure,

a pair of circumferentially-extending raised rings, respectively being an outer stopping ring and an adjacent relatively-shorter inner stabilizing ring, the respective facing slopes of which at least partially define a valley therebetween,

one of said rib structure or said pair being formed on the outer distal surface of said ejector tube and the other being formed on the inner proximal surface of said outer tube,

said rib structure and said rings each being radially spaced from the tube other than the tube on which it is formed at least when said tubes are not in the telescopically collapsed position,

said rib structure radially partially overlapping said pair by an amount such that the shorter stabilizing ring is aligned to make an interference fit with said rib structure and the taller stopping ring is aligned effectively to obstruct said rib structure from passing axially beyond said stopping ring in the proximal direction in normal use,

said valley and said rib structure being compatibly shaped such that the latter is adapted to seat in said valley, to be captured between and to engage each of the facing slopes of said rings when seated therebetween, and to ride up the respective one of such slopes if axially displaced from the seated position in the direction of such one slope, whereby the restraining means stabilizes the tubes against relative wobble when said rib structure is seated in said valley.

4,960,418

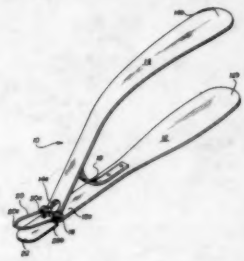
SURGICAL INSTRUMENT AND METHOD FOR CUTTING THE LENS OF AN EYE

Jerald L. Tennant, 806 Greentree Ct., Duncanville, Tex. 75137

Filed Apr. 20, 1989, Ser. No. 341,140

Int. Cl.[5] A61B *17/32, 17/28*

U.S. Cl. 606—107 **19 Claims**



1. A ophthalmic surgical instrument for cutting the lens of an eye comprising:

a first support member having first and second ends;

a second support member having first and second ends;

said support members being interconnected for movement between an open position and a closed position;

a wire loop extending from said first end of said first support member; and

a plate member interconnected to said first end of said second support member and being disposed adjacent to said wire loop, such that in said open -position of said support members, said wire loop is spaced apart from said plate member to receive the lens therebetween and in the closed position of said support members, said wire loop contacts said plate member to cut the lens disposed between said wire loop and said plate member by pressing the lens against said plate member and cutting the lens with said wire loop.

4,960,419

SURGICAL TISSUE SEPARATION SYSTEM AND SURGICAL KNIFE PARTICULARLY USEFUL THEREIN

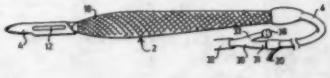
Lior Rosenberg, 13 Harduf Street, Omer, Beersheba, Israel

Filed Jan. 11, 1988, Ser. No. 141,865

Claims priority, application Israel, Jan. 23, 1987, 81376

Int. Cl.[5] A61B *17/30*

U.S. Cl. 606—37 **14 Claims**



1. A surgical tissue separation system comprising: a handle including a hollow metal shank, and a layer of insulating material thereover; a metal blade mounted to one end of the handle; means for supplying electricity to said metal blade; said handle being formed with a throughgoing bore from said one end to the opposite end; and a suction tube connected to the opposite end of the handle by a connector which includes a first connector section for connection to the suction tube, a second connector section for connection to a vacuum source for removing smoke and fumes produced by burnt tissue, and a third connec-

tor section for connection to an auxiliary vacuum device for removing fluids.

4,960,420

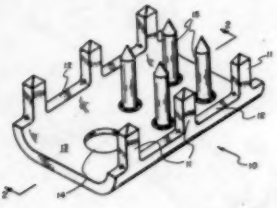
CHANNEL LIGAMENT CLAMP AND SYSTEM

E. Marlowe Goble, 550 E. 1400 North, Suite M, and W. Karl Somers, 651 N. 150 West, both of Logan, Utah 84321

Filed Aug. 23, 1988, Ser. No. 235,194

Int. Cl.[5] A61F *5/04*; A61B *17/04*; F16B *15/00*

U.S. Cl. 606—72 **19 Claims**



1. A channel ligament clamp system for attaching a ligament to a bone surface, that is either a biologic graft or a prostetic ligament, to a bone surface comprising, a pointed instrument for piercing a ligament maintained on a bone surface to score that bone surface therebelow; means for forming a right angle hole into that bone surface at that second point; a channel ligament clamp for human implantation that includes a web between channel sides, which said web includes a plurality of pins that individually extend therefrom and are alongside and parallel to said channel sides, which said web includes at least one laterally centered hole formed therethrough; drill guide means that includes a body with a right angle post extending therefrom, said body including holes formed therethrough that are in the pattern of said channel ligament clamp pins, said drill guide means right angle post for fitting into said hole formed in said bone to position said pin holes appropriately on the bone surface to receive a drill turned therethrough into said bone surface; seating tool means for locating said channel ligament clamp web hole over said hole that is formed through said ligament and said hole formed in the bone and said seating tool means for urging said channel ligament clamp pins through said ligament to enter the pin holes drilled into said bone surface; and a screw-type fastener means for turning through said aligned web and ligament holes and into said bone, sandwiching said ligament against said bone surface between said channel sides.

4,960,421

DEPILATORY DEVICE

Yair Daar, Moshav Galia, and Shimon Yahav, 61 Remez Street, Rehovot, both of Israel

Filed Jan. 17, 1989, Ser. No. 297,832

Claims priority, application Israel, Feb. 22, 1988, 85501; Dec. 6, 1988, 88609

Int. Cl.[5] A61B *17/00*

U.S. Cl. 606—133 **12 Claims**

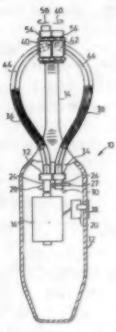
7. A depilatory device comprising:

a hand-held portable housing;

motor means disposed in said housing;

at least one helical spring arranged to be driven by said motor means in rotational sliding motion relative to skin bearing hair to be removed, said at least one helical spring including an arcuate hair engaging portion arranged to define a convex side at which the windings of the spring are spread apart and a concave side corresponding thereto at which said windings are pressed together, said rotation motion of said helical spring producing continuous motion of said windings from a spread-apart orientation at said convex side to a pressed together orientation at said concave side for engagement and plucking of hair from the skin; and

means for varying the orientation of said at least one helical spring relative to said housing, whereby the orientation of



the at least one helical spring may be varied between a first extreme orientation wherein the arcuate portion thereof lies generally in a first plane and a second extreme orientation wherein the at least one helical spring lies in a second plane, generally perpendicular to said first plane.

4,960,422

DEPILATING APPLIANCE

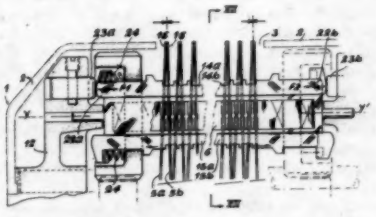
Jacques Demeester, 1, rue Peron F-78290, Croissy Sur Seine, France

Filed Jan. 17, 1989, Ser. No. 297,435

Claims priority, application France, Feb. 9, 1988, 88 01499

Int. Cl.[5] A61B *17/00*

U.S. Cl. 606—135 **11 Claims**



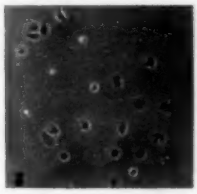
1. A depilating appliance for plucking out hairs to be removed, comprising a rotatable roller (4) comprised by a series of pinching blades (5*a*, 5*b*) disposed side by side, a rotatable central shaft (6) on which the blades (5*a*, 5*b*) are carried and by which the blades are driven in rotation, means mounting said blades (5*a*, 5*b*) on said shaft (6) for pivoting each about a separate axis (X–X') perpendicular to said shaft (6), a casing (1) within which said blades are disposed, said casing having an opening (3) therethrough through which said blades are exposed and means for pivoting said blades about said separate axes (X–X') upon rotation of said roller (4) such that adjacent said opening each blade contacts alternately the adjacent blade on the one side thereof and the adjacent blade on the other side thereof, so as to pinch hairs between the blades to pluck them out.

4,960,423

METHOD OF ENHANCING THE ATTACHMENT OF ENDOTHELIAL CELLS ON A MATRIX AND VASCULAR PROSTHESIS WITH ENHANCED ANTI-THROMBOGENIC CHARACTERISTICS

Donald W. Smith, 609 S. Clinton St., Baltimore, Md. 21224

Filed Nov. 17, 1982, Ser. No. 442,458
Int. Cl.[5] A61F 2/06, 2/02
U.S. Cl. 623—1 13 Claims



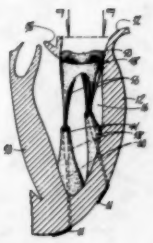
1. The combination of a synthetic vascular prosthesis having a blood contacting surface and suitable for use as a replacement artery or vein and a resilient coating on the blood contacting surface of said prothesis of a water soluble peptide derived from elastin and having desmosine as part of the structure capable of enhancing the attachment of endothelial cells to said blood-contacting surface, said prosthesis thus having an enhanced anti-thrombogenic blood contacting surface.

4,960,424

METHOD OF REPLACING A DEFECTIVE ATRIO-VENTRICULAR VALVE WITH A TOTAL ATRIO-VENTRICULAR VALVE BIOPROSTHESIS

Ronald K. Grooters, 3300 Fuller Rd., West Des Moines, Iowa 50265

Filed Jun. 30, 1988, Ser. No. 214,128
Int. Cl.[5] A61F 2/24
U.S. Cl. 623—2 21 Claims



11. A method of replacing a defective atrio-ventricular valve in a heart of a patient with a replacement valve having an annulus and a plurality of elongated members extending therefrom, the method comprising:

removing the defective valve from the patient's heart;

inserting each elongated member of the replacement valve longitudinally through a papillary muscle and the heart wall of the patient's heart;

securing the annulus of the replacement valve to the annulus of the patient's heart; and

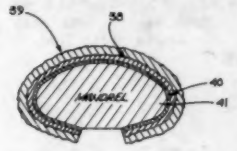
securing the elongated members of the replacement valve to the exterior of the heart wall of the patient.

4,960,425

TEXTURED SURFACE FROSTHESIS IMPLANTS

John Y. J. Yan, and Bobby K. Purkait, both of Santa Barbara, Calif., assignors to Mentor Corporation, Goleta, Calif.

Continuation of Ser. No. 54,607, May 27, 1987, abandoned. This application Aug. 4, 1989, Ser. No. 393,113
Int. Cl.[5] A61F 2/12, 2/02
U.S. Cl. 623—8 24 Claims



1. A surgical prosthesis comprising:

an outer membrane forming an enclosure and comprising a textured exterior surface disposed over at least a portion of said outer membrane, said texture exterior surface being substantially non-absorbent to body fluids and substantially free of fiber and being formed of a plurality of raised portions and indentations, wherein said raised portions are 0.0003 to 0.030 inches in height and 0.0003 to 0.10 in width; and

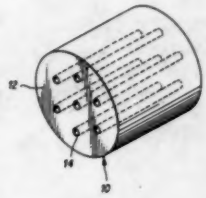
a filler material disposed within said enclosure.

4,960,426

OSTEOFILLERS OF HYDROXY APATITE

Kiminori Atsumi, Tokyo, Japan, assignor to Denatal Kagaku Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 169,504, Mar. 17, 1988, abandoned. This application Jun. 5, 1989, Ser. No. 363,413
Claims priority, application Japan, Aug. 26, 1987, 62-210175
Int. Cl.[5] A61F 2/28
U.S. Cl. 623—16 6 Claims



1. A porous osteofiller of high mechanical strength and improved bioaffinity , which osteofiller comprises an extruded columnar body of sintered hydroxy-apatite having a selected height and at least one capillary through-hole passing through said columnar body in the vertical direction.

4,960,427

BALL AND SOCKET BEARING FOR ARTIFICAL JOINT

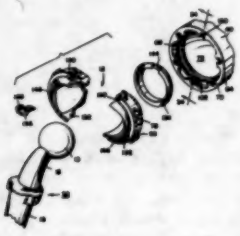
Douglas G. Noiles, New Canaan, Conn., assignor to Joint Medical Products Corporation, Stamford, Conn.

Continuation of Ser. No. 69,821, Jul. 6, 1987, abandoned, which is a continuation of Ser. No. 553,520, Nov. 21, 1983, Pat. No. 4,678,472, which is a continuation-in-part of Ser. No. 473,431, Mar. 8, 1983, Pat. No. 4,642,123. This application Apr. 24, 1989, Ser. No. 342,722

The portion of the term of this patent subsequent to Feb. 10, 2004, has been disclaimed.

Int. Cl.[5] **A61F** *2/34*

U.S. Cl. 623—22 **4 Claims**



1. A ball and socket joint for implantation in a human body comprising a ball portion and a socket portion,

a ball; and

first fixation means adapted for attachment to a first bony structure, said fixation means being connected to said ball by a neck element; and

the socket portion including:

a bearing element having an inner bearing surface configured to receive and engage a portion of the ball wherein the ball in combination with the neck element are free to move within the bearing element in a plurality of directions;

second fixation means adapted for attachment to a second bony structure, said second fixation means having a cavity for receiving the bearing element, said cavity having an opening defining a first plane through which the bearing element enters the cavity; and

securing means for securing the bearing element to said second fixation means in any one of a plurality of selectable angular orientations about a first axis perpendicular to the first plane;

wherein:

(a) the bearing element is non-symmetric about the first axis such that the angular range of motion of the ball with the neck element within the bearing element relative to the first axis is smaller in at least one direction than in at least one other direction; and

(b) the securing means is configured to cooperate with the second fixation means to allow the bearing element, when seated in the cavity, to be rotated within the cavity about the first axis and to be locked to the second fixation means in any one of the selectable angular orientations.

4,960,428

METHOD FOR LIMING SKINS AND HIDES

Juergen Christner, Bickenbach; Ernst Pfleiderer, Darmstadt-Arheilgen, and Tilman Taeger, Seeheim-Jugenheim, all of Fed. Rep. of Germany, assignors to Röhm GmbH, Darmstadt, Fed. Rep. of Germany

Filed Jan. 26, 1989, Ser. No. 303,270

Claims priority, application Fed. Rep. of Germany, Jan. 29, 1988, 3802640

Int. Cl.[5] C14C *1/04*

U.S. Cl. 8—94.18 21 Claims

1. A process for liming salted or fresh skins and hides with preservation and separation of removed hair, which method comprises the following successive steps:

(A) soaking said skins and hides for 4 to 48 hours at a pH between 7 and 10.5 in an aqueous liquor containing at least one surfactant;

(B) incubating said soaked skins and hides for 30 to 180 minutes at a pH between 9 and 11 in an aqueous liquor substantially free of inorganic sulfide which provides sulfide or hydrogen sulfide ions and containing an unhairing agent comprising a hydrotrope and an organic sulfur compound having reducing action;

(C) immunizing hair by bringing the pH of the liquor of (B) to between 10 and 14 by the addition thereto of a base and agitating the skins and hides in the resultant liquor for 1 to 12 hours;

(D) loosening hair by adding inorganic sulfide providing sulfide or hydrogen sulfide ions to the liqour of (C) in an amount from 0.5 to 3 percent by weight of the salted or fresh skins and hides and contacting said skins and hides therewith at a pH of 10 to 14 for 30 to 180 minutes;

(E) separating the skins and hides from the loosened hair; and

(F) fully liming the unhaired skins and hides in from 50 to 500 percent, by weight of the salted or fresh skins and hides, of aqueous liqour comprising inorganic sulfide which provides sulfide or hydrogen sulfide ions, alkali, and liming auxiliaries.

4,960,429

CHROMIUM FREE PROCESS FOR THE TANNING OF HIDES

Roberto C. Colom; Jordi J. Duque Ros, and Juan J. P. Herrerq, all of Barcelona, Spain, assignors to Hispano Quimica, S.A., Barcelona, Spain

Filed Mar. 9, 1989, Ser. No. 321,006

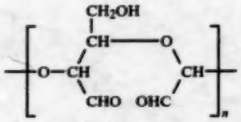
Claims priority, application Spain, Nov. 17, 1988, 8803504

Int. Cl.[5] C14C *3/02, 3/04*

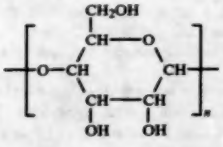
U.S. Cl. 8—94.26 7 Claims

1. A chromium free process for the tanning of animal hides which includes, after the standard pretreatment of the hide, covalently modifying the skin collagen of said hide by a process which comprises:

contacting said hide with a bath containing a selectively oxidated polysaccharide polymer composition comprising a mixture of the following compounds A, B, C and D represented by the following monomeric formulas:

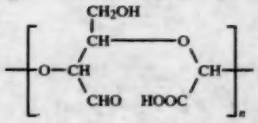


A

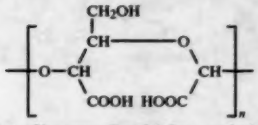


B

-continued



C



D

at a pH value of between 7 and 9 for a period of 4 to 24 hours, at room temperature,

washing and treating said hide by adding to said bath an acidifying agent at a pH up to 2.0,

adding a soluble titanium salt to said bath at a pH of 1.0,

basifying said bath up to a pH of 2.5, and

neutralizing said hide to a pH of 5.5, and then proceeding with after-treatment to obtain the finished hide product.

4,960,430

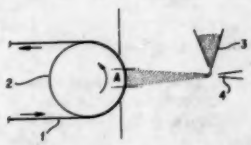
METHOD FOR MANUFACTURING OF MAT AND ROUGH, LAMINAR, RIBBON-SHAPED OR FIBROUS POLYMERIC PRODUCTS WITH A STREAM OF PARTICLES

Heinz Koerber; Rudolf Hanke; Helmar Paessler; Bernd Kessler; Manfred Raetzsch; Adolf Heger, all of Dresden, and Karl-heinz Kolletzky, Greiz, all of German Democratic Rep., assignors to Veb Greika Griez Weberei und Veredlung, Greiz, German Democratic Rep.

Filed Apr. 26, 1988, Ser. No. 186,323

Int. Cl.[5] B24C *1/06;* D06Q *1/00*

U.S. Cl. 8—114 2 Claims



1. Method of treating a synthetic polymeric product in the form of a sheet, strand or filaments to render a surface thereof mat or rough, comprising impacting the surface at a temperature of from 15° C. to the softening point of the polymer with 0.1 to 2 mm size particles of sand, glass, corundum or a metal, said impacting being effected by directing onto the surface a stream of gas carrying the particles.

4,960,431

WET ABRASION RESISTANT YARN AND CORDAGE: AQUEOUS FINISH WITH OXIDIZED POLYETHYLENE AND AMMONIUM HYDROXIDE

Colleen W. Cordova, Midlothian, and Robert M. Marshall, Chester, both of Va., assignors to Allied-Signal Inc., Morris Township, Morris County, N.J.

Division of Ser. No. 791,007, Oct. 24, 1985, abandoned. This application May 16, 1988, Ser. No. 194,241

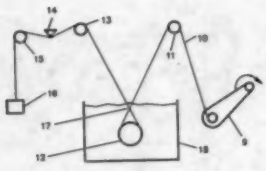
Int. Cl.[5] D06M *11/00;* B32B *27/34;* D02G *3/00*

U.S. Cl. 8—115.6 6 Claims

1. A method of producing a wet abrasion resistant cordage from yarn comprising:

treating the yarn after drawing with an effective amount of

an aqueous overfinish composition consisting essentially of an oxidized polyethylene, neutralized with ammonium



hydroxide and emulsified with a non-nitrogen nonionic emulsifier.

4,960,432

META-PHENYLENEDIAMINES, PROCESS FOR PREPARATION THEREOF, INTERMEDIATE COMPOUNDS AND USE OF THESE META-PHENYLENEDIAMINES AS COUPLERS FOR THE OXIDATION DYEING OF KERATINOUS FIBRES AND ESPECIALLY HUMAN HAIR

Alex Junino, Livry-Gargan; Jean J. Vandenbossche, Aulnay-sous-Bois; Herve Borowiak, Tremblay-les-Gonesse, and Gerard Lang, Saint-Gratien, all of France, assignors to L'Oreal, Paris, France

Filed May 31, 1988, Ser. No. 200,170

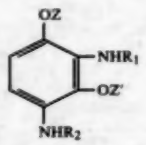
Claims priority, application Luxembourg, May 29, 1987, 86905

The portion of the term of this patent subsequent to Sep. 12, 2006, has been disclaimed.

Int. Cl.[5] A61K *7/13;* **C07C** *215/78, 215/80*

U.S. Cl. 8—411 **17 Claims**

1. A hair dye composition comprising in a cosmetically acceptable aqueous vehicle, 0.05 to 3.5 weight percent of at least one compound, as a coupler, having the formula



(I)

wherein

R_1 and R_2, each independently , represent hydrogen, alkyl having 1–4 carbon atoms, monohydroxyalkyl having 2–3 carbon atoms or polyhydroxyalkyl having 2–3 carbon atoms,

Z and Z', each independently, represent alkyl having 1–4 carbon atoms or hydroxyalkyl having 2–4 carbon atoms, with the proviso that, when R_1 and R_2 simultaneously represent hydrogen, Z and Z' do not simultaneously represent methyl, and

the acid addition salt thereof,

in combination with at least one oxidation dye precursor of the para type in an amount effective to dye said hair.

4,960,433

DEPOSITION PROCESSES

Stanley Renton, Penkridge, England, assignor to Albright & Wilson Limited, Oldbury, England

Continuation of Ser. No. 232,511, Aug. 12, 1988, abandoned, which is a continuation of Ser. No. 117,883, Oct. 23, 1987, abandoned, which is a continuation of Ser. No. 5,487, Jan. 20, 1987, abandoned, which is a division of Ser. No. 731,526, May 7, 1985, Pat. No. 4,655,787. This application Jul. 10, 1989, Ser. No. 379,658

The portion of the term of this patent subsequent to Apr. 7, 2004, has been disclaimed.

Int. Cl.[5] C25D *13/06;* **B05D** *3/10;* **C09D** *5/44*

U.S. Cl. 8—506 **33 Claims**

1. A process for incorporating a dye into an electrophoretically deposited resin film prior to curing of the resin and by immersion in a solvent containing the dye, wherein the dye is one having substantially low solubility in water and is dissolved in a solvent medium containing water and a water-miscible organic solvent in which there is also dissolved a hydrotrope whereby the solvent medium contains an effective quantity of dye to impart the desired coloration to the film but does not significantly damage the film, allowing the dye to become absorbed into the resin film, and then curing the resin.

4,960,434

AZO DISPERSE DYE MIXTURE GIVING BRIGHT BLUE SHADES ON POLYESTER TEXTILES

David Brierley, Royton, and Alan T. Leaver, Worsley, both of England, assignors to Imperial Chemical Industries plc, London, England

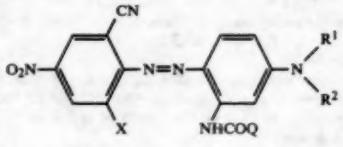
Continuation of Ser. No. 219,778, Jul. 18, 1988, abandoned. This application Jun. 7, 1989, Ser. No. 363,331

Claims priority, application United Kingdom, Jul. 22, 1987, 8717309

Int. Cl.[5] C09B *29/08, 67/22;* **D06P** *1/18, 3/36*

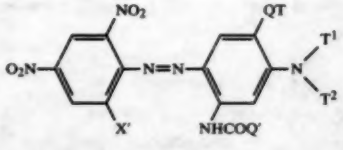
U.S. Cl. 8—524 **7 Claims**

1. A dye composition comprising an intimate mixture of a dye of the formula:



I

and a dye of the formula:



II

(hereinafter called Component II) wherein

X and X' are each independently selected from Br, Cl and I;

Q and Q' are each independently C_{1-4}-alkyl; T is C_{1-4}-alkyl;

R^1 and R^2 are each independently C_{1-4}-alkyl or C_{2-4}-alkenyl; and

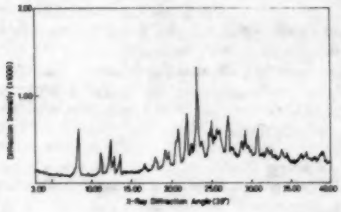
T^1 and T^2 are each independently C_{10-4}-alkyl or C_{2-4}-alkenyl

where said composition contains from 80–85% of the dye of formula I and 20–15% of the dye of Formula II.

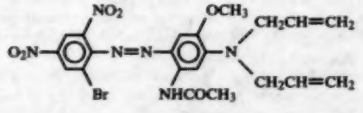
4,960,435
CRYSTALLINE FORM OF ACETAMIDO-AMINO-NITRO-AZO-BENZENE DYE AND A PROCESS FOR PREPARING THE SAME

Mitsuki Tunoda, Shirasoka, and Nobuharu Suzuki, Yono, both of Japan, assignors to Nippon Kayaku Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 5, 1989, Ser. No. 446,136
Claims priority, application Japan, Dec. 15, 1988, 63-314910
Int. Cl.[5] C09B *67/02, 29/08*; D06P *1/18*
U.S. Cl. 8—526 **10 Claims**



1. A heat-stable β-crystalline form of the dye represented by the following formula (1):

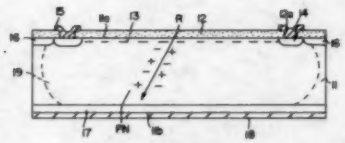


(I)

characterized by an X-ray diffraction pattern having a strong peak at the angle of diffraction (2θ) of 23.2° and relatively strong peaks respectively at the angles of diffraction (2θ) of 8.3°, 12.3°, 20.8°, 21.9°, 25.0°, 27.°, 29.2° and 30.8° according to X-ray powder diffractometry through the use of a Cu-Kα line.

4,960,436
RADIATION OR LIGHT DETECTING SEMICONDUCTOR ELEMENT CONTAINING HEAVILY DOPED P-TYPE STOPPER REGION

Noritada Sato, Kanagawa, Japan, assignor to Fuji Electric Corporate Research & Development, Kanagawa, Japan

Division of Ser. No. 528,077, Aug. 31, 1983, abandoned. This application Feb. 6, 1985, Ser. No. 698,616
Claims priority, application Japan, Sep. 18, 1982, 57-162838; Sep. 18, 1982, 57-162839
Int. Cl.[5] H01L *31/18*
U.S. Cl. 437—3 **1 Claim**

1. A method for producing a radiation or light detecting semiconductor element comprising a silicon substrate of a first conductivity type having a high specific resistance, a stopper layer formed in a part of a first principal surface of said substrate and diffused to provide a first conductivity type, an electrode diffusion layer formed in at least part of the remaining part of said first principal surface not provided with said stopper layer so as to be diffused into a second conductivity type reverse to the first conductivity type, a metal oxide layer formed on said first principal surface of said substrate such that the oxide layer covers said principal surface substantially entirely, a first electrode provided through said metal oxide layer and electrically connected to electrode diffusion layer, and a second electrode deposited electrically conductively on a second principal surface of said substrate, said method comprising:

forming a diffusion layer of a heavily diffused p-type in a peripheral part of the first principal surface of said silicon substrate that exhibits a weak p-type conductivity substantially equal to that of an intrinsic semiconductor;

forming a diffusion layer of an n-type conductivity in at least part of the remaining said first principal surface excluding said peripheral part;

forming a metal oxide layer on said first principal surface of said substrate;

injecting positive ions into said metal oxide layer after the completion of said metal oxide layer;

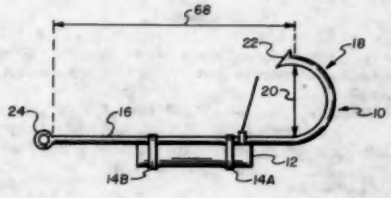
forming a first electrode on said first principal surface such that said first electrode penetrates said metal oxide layer to provide an ohmic contact with said n-type diffusion layer; and

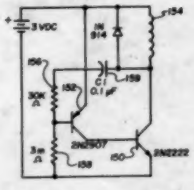
forming a second electrode on a second principal surface of said substrate so that ohmic contact is provided between the second electrode and said substrate.

4,960,437
FISHING LURE

Teddie G. Watson, Henderson, Nev., and Jeffrey Orth, Salt Lake City, Utah, assignors to Comet Technologies, Inc., Salt Lake City, Utah

Filed May 22, 1989, Ser. No. 354,917
Int. Cl.[5] A01K *85/00*
U.S. Cl. 43—42.31 **18 Claims**





1. A fishing lure comprising:

hook means for fishing in water, said hook means including hooking structure and a shaft extending therefrom a preselected distance;

operation means secured to said shaft, said operation means including

a water-resistant container,

securing means for securing said water-resistant container to said shaft,

an oscillator circuit positioned within said water-resistant

container to generate and supply preselected patterned electrical signals,

battery means positioned within said water-resistant container and conductively connected to supply electrical power to said oscillator circuit,

luring means mechanically associated with said water-resistant container and connected to said oscillator circuit to receive said preselected patterned electrical signals therefrom for generating fish luring action in accordance therewith; and

connecting means associated with said hook means for connecting said hook means to structure for operation by a remote operator.

4,960,438

BRIQUETTE AN RELATED PROCESS

Yoel Benesh, and Tony L. Bark, both of Highland Park, Ill., assignors to The Barkesh Company

Filed May 30, 1989, Ser. No. 357,942

Int. Cl.[5] C10L *5/44*

U.S. Cl. 44—589 **12 Claims**

1. In a briquette that can be used for smoke flavoring and barbecuing wherein a number of briquettes that have been molded to a briquette shape and held together by a non-toxic glue whereby said briquettes can be used to heat and flavor foods supported and proximately located to the smoke and heat directed therefrom,

a briquette made of a homogenous mixture of olive residue including olive pits and olive pulp wherein there is some olive oil that is still a part of the olive residue, and said non-toxic glue holds the olive residue together whereby when the briquettes are ignited they can act to flavor and barbecue through the heat and olive oil vapors given off from the smoke of the inflamed briquettes.

3. A briquette as defined in claim 1, wherein a citric acid is added to the glue in order to keep the mixture from fermenting without changing the kindling quality of the briquettes.

4,960,439

ARRANGEMENT FOR GASIFYING FUELS

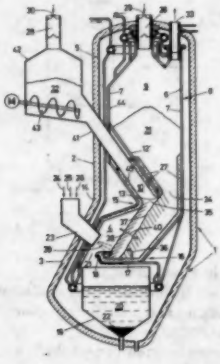
Paul Freimann, St. Valentin, and Gernot Staudinger, Graz, both of Austria, assignors to Voest-Alpine Aktiengesellschaft, Linz, Austria

Continuation of Ser. No. 832,988, Feb. 25, 1986, abandoned. This application Aug. 12, 1988, Ser. No. 291,402

Claims priority, application Austria, Mar. 8, 1985, 695/85

Int. Cl.[5] C10J *3/20*

U.S. Cl. 48—62 R **3 Claims**



1. In an arrangement for gasifying fuels with oxygen or oxygen-containing gases and steam including a vessel that accommodates solid charging stock, said vessel having an upper section, a lower section and side walls and including a gas discharge duct on said upper section, a primary gas chamber within said lower section, means defining a first charging passage between said primary gas chamber and said upper section providing passage of said solid charging stock into said primary gas chamber, burner means penetrating through a side wall of said vessel into said primary gas chamber and including feed means for at least one of oxygen and oxygen-containing gases as well as for fuel and steam, a trough in said vessel arranged below said primary gas chamber to accommodate slag, and a support bottom above said trough, said support bottom defining the lower end of said primary gas chamber so that when said solid charging stock is charged into said vessel a first bed of said solid charging stock having a first sloping surface facing said burner means is formed,

the improvement comprising providing:

a charging stock supply duct for supplying charging stock to be gasified entering into said vessel in its burner-side wall, said supply duct including walls and a slide surface; a partition wall extending obliquely downward from said burner-side wall so as to divide said vessel upper section into a first compartment and a second compartment, said first compartment including said gas discharge duct in its upper portion and being provided with a charging stock supply duct at its upper end, said first charging passage being between said primary gas chamber and said first compartment; said second compartment containing the burner-side wall supply duct; and means defining a second charging passage between said primary gas chamber and said burner-side wall supply duct, said second passage providing passage of said charging stock to be gasified therethrough to form a second bed of said charging stock to be gasified having a free second sloping surface facing said burner means, said second bed lying in front of said first bed.

4,960,440

PROCESS FOR REDUCING THE QUANTITY OF UNDESIRED COMPOUNDS IN THE GENERATION OF PYROLYSIS GAS

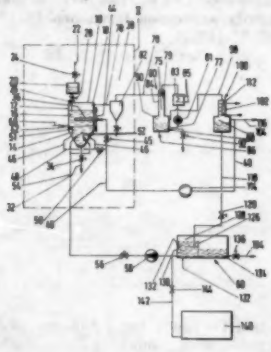
Monika Betz, Ketsch, Fed. Rep. of Germany, assignor to Asea Brown Boveri Aktiengesellschaft, Mannheim, Fed. Rep. of Germany

Filed Nov. 21, 1988, Ser. No. 274,502

Claims priority, application Fed. Rep. of Germany, Nov. 19, 1987, 3739157; Oct. 14, 1988, 3835038

Int. Cl.[5] C10J *3/54*

U.S. Cl. 48—197 R **11 Claims**



1. Process for improving yields and for reducing the quantity of undesired compounds obtained during the generation of pyrolysis gas from hydrocarbon-containing waste starting materials, which comprises the steps of generating pyrolysis

gas by the pyrolytic decomposition of said starting material in a fluidized bed pyrolysis reactor in a reducing atmosphere, cooling and condensing the water vapor and undesired compounds formed and entrained by the pyrolysis gas as process water in a cooling stage, recycling and spray feeding at least a portion of the condensed process water to the fluidized bed section of the pyrolysis reactor, and pyrolytically processing the starting material with the portion of the process water fed therein at a temperature above 650° C.

4,960,441

SINTERED ALUMINA-ZIRCONIA CERAMIC BODIES

Scott W. Pellow; Ronald W. Trischuk, both of Niagara Falls; Christopher E. Knapp, Hamilton, and Ralph Bauer, Niagara Falls, all of Canada, assignors to Norton Company, Worcester, Mass.

Continuation-in-part of Ser. No. 175,802, Mar. 31, 1988, abandoned, which is a continuation-in-part of Ser. No. 48,175, May 11, 1987, abandoned. This application May 9, 1988, Ser. No. 192,277

Int. Cl.[5] B24D *3/00*

U.S. Cl. 51—293 37 Claims

1. A ceramic body comprising well intermixed microcrystals of alpha alumina and zirconia with at least three-fourths of said microcrystals appearing to have a maximum dimension between 0.25 and 1 micron when viewed in cross section in an electron micrograph at a magnification of about 10,000–20,000 X, said ceramic body containing from 50 to 95 weight percent of alumina and from 50 to 5 weight percent of zirconia.

4,960,442

FLEXIBLE GRINDING TOOL

Eckhard Wagner, Elmshorn, and Angelika Eichler, Pinnerberg, both of Fed. Rep. of Germany, assignors to Norddeutsche Schleifmittel-Industrie Christiansen & Co (GmbH & Co), Fed. Rep. of Germany

Filed Mar. 14, 1989, Ser. No. 323,314

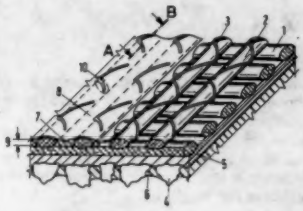
Claims priority, application Fed. Rep. of Germany, Mar. 14, 1988, 3808426

Int. Cl.[5] C09K *3/14*

U.S. Cl. 51—295 20 Claims

1. A flexible grinding tool such as a grinding belt comprising:

a grain layer containing an abrasive on a binder, and a flexible backing layer which has a front side that bears on the binder and a rear side which carries a finish that contains an ingredient composed of predominantly plate-like mineral particles.



4,960,443

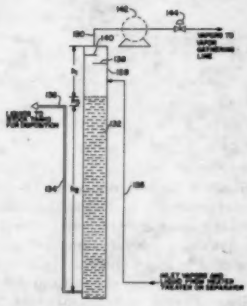
PROCESS FOR SEPARATION OF HYDROCARBON VAPORS AND APPARATUS THEREFOR

Jerry R. Lansford, Longview, Tex., assignor to Chevron Corporation, San Francisco, Calif.

Filed Oct. 4, 1985, Ser. No. 784,029

Int. Cl.[5] B01D *19/00*

U.S. Cl. 55—45 13 Claims



1. A process for the separation of hydrocarbon vapors from an admixture of hydrocarbon gases and hydrocarbon liquid which comprises passing said admixture into the upper portion of a vapor recovery zone comprising a vertical, elongated separation zone, withdrawing hydrocarbon gases from said upper portion of said upper portion of said separation zone into a vapor line, said vapor line being provided with a pressure control valve means, said admixture being introduced into said vapor separation zone below the point at which said hydrocarbon gases are withdrawn from said separation zone,

said liquid introduced into said separation zone forming a first vertical liquid column beneath said vapor recovery zone, said liquid flowing in a generally downward, vertical direction to a point in the lower portion of said vapor recovery zone, changing direction and then flowing in an upward, substantially vertical direction forming a second vertical column of liquid, passing said liquid from said second vertical liquid column to an oil retaining zone having an upper, gaseous zone and a lower liquid zone, said second vertical liquid column maintaining a seal between said gaseous zone of said oil retaining zone and the gas-containing upper portion of said separation zone, the height of said first vertical liquid column being at least h_3 feet greater than the height of said second vertical liquid column, wherein h_3 has the value

$$h_3 \geq x\,(0.491)g_c/\rho g$$

and said second vertical liquid column has a height, h_2, wherein h_2 has the value

$$h_2 \geq P_g g_c / \rho g$$

wherein

ρ = density of said hydrocarbon liquid in lb./ft^3

x = vacuum in inches of mercury in said vapor line which determines the height of h_3

g = 32.2 ft./s^2

g_c = 32.2 lb$_m$-ft./lb$_f$-s and

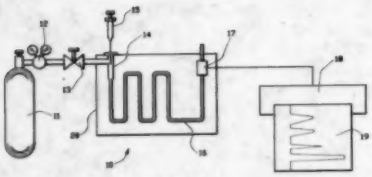
P_g = pressure in said vapor line in pounds per square inch which determines the height h_2.

4,960,444

METHOD FOR THE DETERMINATION OF ORGANIC ACIDS IN AN AQUEOUS SAMPLE BY; GAS CHROMATOGRAPHY

Labib Ghaoui, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Sep. 26, 1989, Ser. No. 412,954
Int. Cl.^{5} B01D *15/08*
U.S. Cl. 55—67 **9 Claims**



1. In a method for the determination of organic acids by gas chromatography generally including the steps of evaporating the organic acids into a stream of mobile phase gas, flowing the mobile phase gas and evaporated organic acids past a stationary phase disposed in a gas chromatography column to separate the organic acids by gas chromatography and then flowing the mobile phase gas and chromatographically separated organic acids to a detector to generate a chromatogram, wherein the improvement comprises the steps of:

(a) evaporating a predetermining volume of an aqueous sample containing the organic acids into the flowing stream of mobile phase gas flowing into the gas chromatography column;

(b) flowing the mobile phase gas and evaporated sample through the gas chromatography column the stationary phase of which comprises polycarbonate resin so that the organic acids are chromatographically separated in the column.

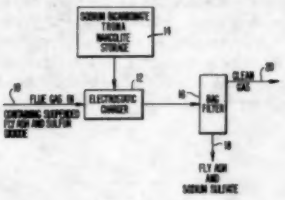
4,960,445

PROCESS FOR REMOVING SO_2 AND FLY ASH FROM FLUE GAS

Dennis J. Helfritch, Flemington, N.J., assignor to Research-Cottrell, Somerville, N.J.

Continuation of Ser. No. 764,715, Aug. 12, 1985, abandoned. This application Nov. 20, 1989, Ser. No. 437,334
Int. Cl.^{5} B03C *3/00*
U.S. Cl. 55—5 **4 Claims**

1. A process for removal of SO_2 and fly ash from flue gas and reducing the ratio of SO_2 sorbent to SO_2 comprising the steps directing a particulate SO_2 sorbent in the size range of from about 1 micron to about 100 microns selected from the group consisting of sodium bicarbonate, Nahcolite and Trona into an electrostatic charger utilizing corona discharge and contacting the flue gas containing suspended fly ash and sulfur dioxide with the SO_2 sorbent; directing the charged sorbent and flue gas to a bag filter; permitting the charged particulate sorbent and fly ash to form a layer on the surface of the bag filter



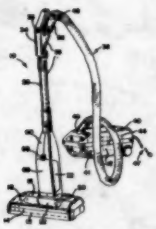
where the SO_2 converts the SO_2 sorbent to sodium sulfate as the flue gas passes through the bag filter.

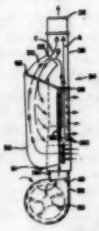
4,960,446

VACUUM CLEANER DIRT RECEPTACLE

Kurt Werner, St. Joseph Township, Berrien County; Leo G. Krieger, Bainbridge Township, Berrien County, both of Mich.; Wilbur C. Bewley, Lexington, and Ennis L. Tillman, Danville, both of Ky., assignors to Whirlpool Corporation, Benton Harbor, Mich.

Filed May 19, 1989, Ser. No. 353,979
Int. Cl.^{5} B01D *46/24*
U.S. Cl. 55—312 **22 Claims**





1. A bag free dirt receptacle for a vacuum cleaner having at least one vacuum mode of operation and a clean-out mode of operation, said receptacle comprising:

a rigid body for collecting dirt having an aperture through which dirt laden air enters said rigid body during at least said vacuum mode of operation and is expelled from said rigid body during said clean-out mode of operation;

an exhaust means formed in said rigid body and having closure means for opening and closing said exhaust means, said closure means opening said exhaust means during said vacuum mode of operation and closing said exhaust means during said clean-out mode of operation; and

air inlet means formed in said rigid body and having valve

means for opening and closing said air inlet means, said valve means closing said air inlet means during said vacuum mode of operation and opening said air inlet means during said clean-out mode of operation.

4,960,447

REACTOR WITH MOVING LAYER FOR THE REMOVAL OF UNDESIRABLE GASEOUS COMPONENTS FROM GASES

Hermann Brüggendick, Hunxe; Raimond Weber, Witten; Ekkehard Richter, Essen-Kettwig, and Berthold Knoppik, Essen, all of Fed. Rep. of Germany, assignors to Bergwerksverband GmbH, Essen, Fed. Rep. of Germany

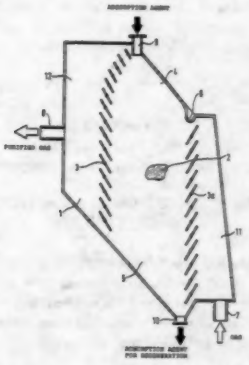
PCT No. PCT/EP87/00639, § 371 Date Jun. 20, 1989, § 102(e) Date Jun. 20, 1989, PCT Pub. No. WO88/03434, PCT Pub. Date May 19, 1988

PCT Filed Oct. 28, 1987, Ser. No. 378,205

Claims priority, application Fed. Rep. of Germany, Nov. 12, 1986, 3638611

Int. Cl.[5] B01D *53/08*

U.S. Cl. 55—390 **3 Claims**



1. A reactor for the removal of a component from a gas stream, comprising:

means defining an upright adsorbent chamber formed at an upper end with an inlet for a granular adsorbent for said component and below said inlet with a distribution compartment, distributing said adsorbent over a horizontal cross section of said adsorbent chamber, an adsorbent outlet at a lower end of said adsorbent chamber, and means for guiding adsorbent to said outlet, said adsorbent inlet and said adsorbent outlet being horizontally offset from one another, whereby granular adsorbent passes in a moving body from said adsorbent inlet to said adsorbent outlet downwardly and laterally;

means on one side of said adsorbent chamber and extending upwardly from said adsorbent outlet along said adsorbent chamber defining a first gas chamber separated from said adsorbent chamber by an array of horizontal shutters forming a first jalousie laterally permeable to gas;

means on an opposite side of said adsorbent chamber from said first gas chamber and extending downwardly from said adsorbent inlet defining a second gas chamber communicating with said adsorbent chamber through an array of horizontal shutters forming a second jalousie adapted to communicate with said adsorbent chamber and to be traversed by gas, said adsorbent chamber between said first and second jalousies being narrower in regions of said adsorbent inlet and said adsorbent outlet than at an intermediate location along a height of said adsorbent chamber so that said adsorbent chamber defines a depth of a bed of said adsorbent in said adsorbent chamber; and

a gas inlet communicating with one of said first and second chambers and a gas outlet communicating with the other of said first and second gas chambers so that gas from said one of said chambers passes diagonally across and through a descending bed of said adsorbent in said adsorbent chamber to said other of said chambers, said gas chambers extending substantially the full heights of the respective jalousies.

4,960,448

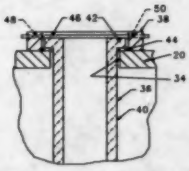
HIGH TEMPERATURE GAS FILTER

Elizabeth C. Zievers, LaGrange, Ill., assignor to Universal Porosics, Inc., LaGrange, Ill.

Filed Oct. 16, 1989, Ser. No. 421,675

Int. Cl.[5] B01D *46/02*

U.S. Cl. 55—523 **8 Claims**



1. In a pressure filter of the type including a pressure tank in which at least one hollow ceramic filter element is positioned in said tank between an inlet to said tank and an outlet from said tank, the combination comprising

a rigid ceramic support member mounted in said tank and separating said inlet from said outlet, said member having at least one of hole extending therethrough from one surface thereof to an opposite surface thereof,

said filter elements being sealably mounted to said rigid ceramic member over said holes and extending from said one surface, and

said inlet and said outlet opening into said tank on respective ones of said surfaces of said rigid ceramic member.

4,960,449

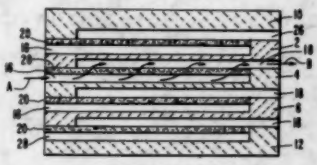
CERAMIC PARTICULATE TRAP AND METHOD OF MAKING THE SAME

Thomas M. Yonushonis, Columbus, Ind., assignor to Cummins Engine Company, Inc., Columbus, Ind.

Filed Feb. 28, 1989, Ser. No. 316,766

Int. Cl.[5] B01D *46/00*

U.S. Cl. 55—523 **11 Claims**



1. A particulate trap for filtering particulate matter entrained in a fluid passing therethrough comprising:

at least one substantially non porous support plate having a plurality of grooves formed in an upper surface thereof extending in a direction of fluid flow and ribs formed between each of said grooves, with each of said grooves having an open upstream end, a closed downstream end and an open surface extending in said direction of fluid flow; and

a ceramic foam layer for filtering said particulate matter

positioned on and supported by said ribs so as to overly said open surface;

wherein said fluid is restricted to flow through said grooves and through said ceramic foam layer such that said entrained particulate matter is removed from said fluid during the flow of said fluid through said particulate trap.

4,960,450

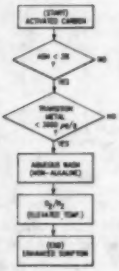
SELECTION AND PREPARATION OF ACTIVATED CARBON FOR FUEL GAS STORAGE

James A. Schwarz, Fayetteville; Joong S. Noh, Syracuse, both of N.Y., and Rajiv K. Agarwal, Las Vegas, Nev., assignors to Syracuse University, Syracuse, N.Y.

Filed Sep. 19, 1989, Ser. No. 409,437

Int. Cl.[5] F25J *3/02*

U.S. Cl. 62—18 **10 Claims**



1. A method of preparing an activated carbon for enhanced sorption of hydrogen or a hydrogen-containing gas, comprising the steps of

selecting a source carbon material that has a low ash content on the order of 3% or less and whose ash content contains a relatively small silicon content on the order of 1000 μg/g or less and a relatively small transition metal content on the order of 3000 μg/g or less, and whose ash content predominantly consists of alkali metals and/or alkali earths;

washing the selected source carbon in an aqueous nonbasic wash to reduce said ash content and to reduce the pH of the carbon;

treating the washed carbon in a flow of oxygen and an inert gas at an elevated temperature to create acidic or basic functional sites on said carbon.

4,960,451

METHOD OF MAKING FUSED HOLLOW COMPOSITE ARTICLES

David A. Malinoski, Manchester, and Robert V. Conde, South Windsor, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Aug. 21, 1989, Ser. No. 396,266

Int. Cl.[5] C03C *25/02*

U.S. Cl. 65—3.2 **3 Claims**

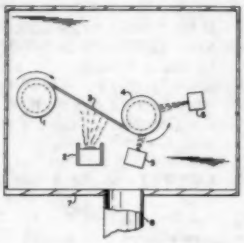
1. A method for producing hollow composite articles from fibers and a glass matrix precursor, wherein said fibers are chemically compatible with said fibers, comprising providing at least one fiber supply reel and at least one fiber take-up reel within a low pressure chamber, said fibers connected to both reels and said glass matrix precursor

a. creating a vacuum within said chamber; b. moving the fibers from said supply reel to said take-up reel;

c. vaporizing the glass matrix precursor inside the chamber in the proximity of the moving fibers, whereby the vaporized glass matrix precursor is deposited on the moving fibers before the fibers reach the take-up reel;

d. heating the fibers that are on the take-up reel by heating means, wherein the means for heating is selected from the group consisting of electron beam guns and lasers;

whereby the outer diameter of the take-up reel is the desired inner diameter of the article, and wherein the vaporized glass



matrix precursor deposits on and thereby coats the fibers with matrix material and the heating of the coated fibers on the take-up reel causes the matrix coating on said fibers to fuse together creating a hollow composite article.

4,960,452

METHOD OF SUPPLYING NUTRIENTS TO PLANTS

Kyle A. Brokken, Eden Prairie, Minn., assignor to Quali Tech, Inc., Chaska, Minn.

Filed Apr. 22, 1988, Ser. No. 185,120

Int. Cl.[5] C05F *5/00*

U.S. Cl. 71—26 **19 Claims**

1. A method of providing nutrients to plants comprising spraying the foliage with an aqueous composition including about 1.5–50 grams per liter of a nutrient complex comprising an alkali-modified brewer's wort incorporating about 0.25–5 grams per liter of an added nutrient divalent metal ion sequestered by said wort.

4,960,453

HYDROXYALKYL-AZOLYL DERIVATIVES AS FUNGICIDES AND PLANT GROWTH REGULATORS

Graham Holmwood, Wuppertal; Gerhard Jäger, Leverkusen; Karl H. Büchel, Burscheid; Wilhelm Brandes, Leichlingen; Stefan Dutzmann, Duesseldorf, and Gerd Hänssler, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed May 5, 1988, Ser. No. 190,601

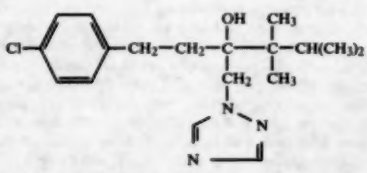
Claims priority, application Fed. Rep. of Germany, May 18, 1987, 3716558

The portion of the term of this patent subsequent to Jan. 16, 2007, has been disclaimed.

Int. Cl.[5] A01N *43/653*; C07D *249/08*

U.S. Cl. 71—92 **5 Claims**

1. The compound 1-(4-chlorophenyl)-3-(1,2,4-triazol-1-ylmethyl)-4,4,5-trimethyl-hexan-3-ol of the formula



or an addition product thereof with an acid or metal salt.

4,960,454

SULPHONYLUREA-TYPE HERBICIDES

Guy Borrod, and Alain Gadras, both of Lyon, France, assignors to Rhone-Poulenc Agrochimie, Lyon, France

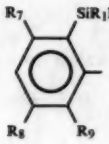
Filed Jun. 15, 1988, Ser. No. 206,740
Claims priority, application France, Jun. 25, 1987, 8709177
Int. Cl.[5] C07D *239/69, 401/12, 403/12, 409/12*
U.S. Cl. 71—92 8 Claims

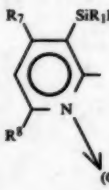
1. A compound containing a sulphonylurea group selected from the compounds of the formula:

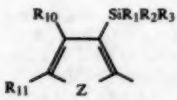
$$L—SO_2—NH—CO—NR_6—A \quad (I)$$

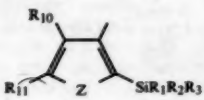
in which:

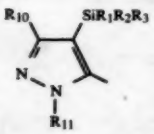
L represents one of the groups of the formulae L-1 to L-6 given below, A represents the group of the formula given below,

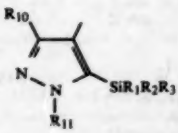

L-1

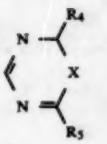

L-2


L-3


L-4


L-5


L-5


(A)

R_1, R_2 and R_3 can be identical or different and represent a C_1–C_4 alkyl radical or a C_7–C_{11} alkyl radical which is unsubstituted or substituted by one or more halogen atoms or C_1–C_4 alkoxy or C_1–C_4 alkylthio radicals, C_3–C_6 cycloalkyl which is unsubstituted or substituted by one or more halogen atoms or C_1–C_4 alkoxy or C_1–C_4 alkylthio radicals, C_1–C_4 alkoxy or C_1–C_4 alkylthio which are unsubstituted or substituted by one or more halogen atoms or C_1–C_4 alkoxy or C_1–C_4 alkylthio radicals,

$R_{13}S(O)_n$—, n being an integer equal to 1 or 2 and R_{13} being a C_1–C_4 alkyl radical which is unsubstituted or substituted by one or more halogen atoms or C_1–C_4 alkoxy or C_1–C_4 alkylthio radicals, $COOR_{14}$, where R_{14} is a hydrogen atom, a C_1–C_4 alkyl or C_3–C_6 cycloalkyl radical which is unsubstituted or substituted by one or more halogen atoms or C_1–C_4 alkoxy or C_1–C_4 alkylthio radicals, C_3–C_6 alkenyl which is unsubstituted or substituted by one or more halogen atoms;

R_{10} and R_{11} can be identical or different and have the same meaning as R_7, with the exception of the halogen atom;

m is 0 or 1;

Z is the oxygen atom, the sulphur atom or the group $=N—R_{12}$, wherein R_{12} is a C_1–C_6 alkyl, C_6–C_{10} aryl or C_7–C_{11} aralkyl radical;

X is a trivalent radical, —CH═;

R_4 and R_5 are identical or different and represent a C_1–C_4 alkyl radical, C_1–C_4 alkoxy radical, C_1–C_4 alkylthio radical, C_1–C_4 haloalkyl radical, C_1–C_4 haloalkoxy radical, C_1–C_4 haloalkylthio radical, C_2–C_6 alkoxyalkyl radical, C_2–C_6 alkoxyalkoxy radical, C_1–C_4 alkylamino radical, di(C_1–C_4 alkyl)-amino radical or a halogen atom;

R_6 represents the hydrogen atom or a C_1–C_4 alkyl radical, or an agriculturally acceptable salt of these compounds.

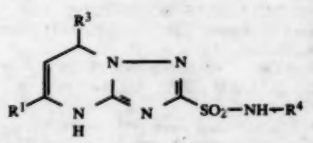
4,960,455

HERBICIDAL TRIAZOLODIHYDROPYRIMIDINE-2-SULPHONAMIDES

Klaus Jelich; Peter Babczinski, both of Wuppertal; Hans-Joachim Santel, Leverkusen; Robert R. Schmidt, Bergisch-Gladbach, and Harry Strang, Duesseldorf, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Mar. 7, 1989, Ser. No. 320,249
Claims priority, application Fed. Rep. of Germany, Mar. 11, 1988, 3808122
The portion of the term of this patent subsequent to Aug. 8, 2006, has been disclaimed.
Int. Cl.[5] A01N *43/713;* C07D *487/04*
U.S. Cl. 71—92 10 Claims

1. A triazolodihydropyrimidine-2-sulphonamide of the formula


(I)

in which

R^1 is hydrogen or alkyl which has 1 to 4 carbon atoms,

R^3 is alkyl which has 1 to 4 carbon atoms or methoxymethyl, and

R^4 is unsubstituted or mono-, di- or trisubstituted phenyl, the substituents being identical or different and being selected from the group consisting of fluorine, chlorine, bromine, methyl, ethyl, n- or iso-propyl methoxy, ethoxy, n- or iso-propoxy, methoxycarbonyl, ethoxycarbonyl, methylthio, ethylthio and n- or iso-propylthio.

4,960,456

FUNGICIDAL AND PLANT GROWTH-REGULATING NOVEL SUBSTITUTED 1-HYDROXYALKYL-AZOLYL DERIVATIVES

Graham Holmwood; Erik Regel, both of Wuppertal; Gerhard Jäger, Leverkusen; Karl H. Büchel, Burscheid; Klaus Lürssen, Bergisch Gladbach; Paul-Ernst Frohberger, Leverkusen; Wilhelm Brandes, Leichlingen, and Volker Paul, Solingen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

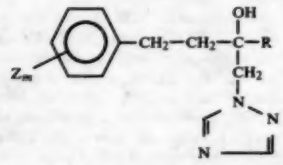
Division of Ser. No. 121,552, Nov. 17, 1987, Pat. No. 4,904,296, which is a division of Ser. No. 683,891, Dec. 20, 1984, Pat. No. 4,734,126, which is a continuation of Ser. No. 458,086, Jan. 14, 1983, abandoned. This application May 19, 1989, Ser. No. 354,329

Claims priority, application Fed. Rep. of Germany, Jan. 27, 1982, 3202601

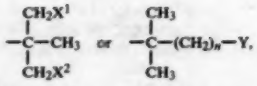
Int. Cl.[5] **A01N** *43/653;* **C07D** *249/08*

U.S. Cl. 71—92 **6 Claims**

1. A substituted 1-hydroxyalkylazolyl derivative of the formula



in which
R is



X^1 is a hydrogen, fluorine or chlorine atom,
X^2 is a fluorine or chlorine atom,
Y is methoxy, ethoxy, methylthio, ethylthio, isopropylthio, or phenyl, phenoxy or phenylthio wherein the phenyl group is optionally substituted by one or two substituents selected from the group consisting of fluorine, chlorine and methyl,
n is 0, 1 or 2,
Z is fluorine, chlorine, methyl, phenyl or chlorophenyl, and
m is 0, 1 or 2,
or an addition product thereof with an acid or metal salt.

4,960,457

SUBSTITUTED 1,3-DIPHENYL PYRROLIDONES AND THEIR USE AS HERBICIDES

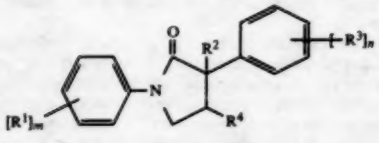
Frank X. Woolard, Richmond, Calif., assignor to ICI Americas Inc., Wilmington, Del.

Filed Dec. 27, 1988, Ser. No. 290,080

Int. Cl.[5] **C07D** *207/26;* **A01N** *43/36*

U.S. Cl. 71—95 **78 Claims**

53. A method of controlling undesirable vegetation comprising applying to said vegetation or to the locus thereof an herbicidally effective amount of a compound having the formula



in which.
m is 1, 2, 3, 4 or 5;
n is 0, 1, 2, 3, 4 or 5;
R^1 is a member selected from the group consisting of halogen, trifluoromethyl, cyano C_1–C_4 alkyl and C_1–C_4 alkoxy, and, when m is greater than 1, may be either a single such member or a combination thereof:
R^2 is a member selected from the group consisting of H and halogen:
R^3 is a member selected from the group consisting of halogen, trifluoromethyl, cyano, C_1–C_4 alkyl and C_1–C_4 alkoxy, and, when n is greater than 1, may be either a single such member or a combination thereof; and
R^4 is a member selected from the group consisting of C_1–C_4 alkyl and halogen-substituted C_1–C_4 alkyl.

4,960,458

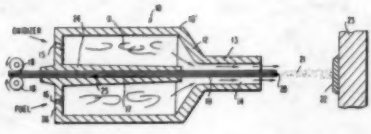
WIRE FEED SYSTEM FOR FLAME SPRAY APPARATUS HAVING INCREASED WIRE

James A. Browning, P.O. Box A, Enfield, N.H. 03748

Filed Dec. 5, 1989, Ser. No. 446,359

Int. Cl.[5] **B01J** *2/02*

U.S. Cl. 427—423 **8 Claims**



1. In a flame spray process including feeding material to be flame sprayed in and through a flame to heat, atomize and project the material against a surface to build up a coating of material on said surface, the improvement wherein said step of feeding material in and through flame comprises feeding said material in the form of a tightly-packed array of wires of circular cross-section whereby the heat transfer area-to-mass ratio of said material and the flame spray rate is significantly increased with droplet particle diameters significantly smaller than those produced under the same conditions from a single wire of circular cross-section of the same outer diameter as that of the array.

4,960,459

METHOD FOR SURFACE ACTIVATION OF WATER ATOMIZED POWDERS BY PICKLING

Jon M. Poole, and Lindy J. Curtis, both of Huntington, W. Va., assignors to Inco Alloys International, Inc., Huntington, W. Va.

Division of Ser. No. 71,654, Jul. 9, 1987, Pat. No. 4,818,482. This application Sep. 19, 1988, Ser. No. 253,841

The portion of the term of this patent subsequent to Apr. 4, 2006, has been disclaimed.

Int. Cl.[5] **C23G** *1/02*

U.S. Cl. 419—63 **10 Claims**

1. A method for treating water atomized powder, the method comprising the steps of:
(a) providing water atomized nickel-base powder;
(b) introducing the powder into a first nitric acid-hydrofluoric acid solution bath;
(c) rinsing the first acid solution from the powder with water;
(d) introducing the rinsed powder into an alkaline solution bath; and
(e) rinsing the alkaline solution from the powder.

4,960,460

RECOVERY OF NON-FERROUS METALS FROM DROSS USING PLASMA TORCH

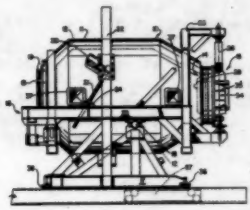
Ghyslain Dube; Jean-Paul Huni; Serge Lavoie, and Wesley D. Stevens, all of Jonquiere, Canada, assignors to Alcan International Limited, Montreal, Canada

Continuation of Ser. No. 286,386, Dec. 19, 1988, Continuation-in-part of Ser. No. 255,060, Oct. 7, 1988. This application Dec. 27, 1989, Ser. No. 457,521

Claims priority, application Canada, Dec. 22, 1987, 555114; Oct. 7, 1988, 579628

Int. Cl.[5] C22B *4/02*

U.S. Cl. 75—10.19 15 Claims



1. A process for recovering a non-ferrous metal from a dross containing the same, which comprises:

introducing the dross into a furnace having a refractory lining;

heating the dross to a temperature above the melting point of the metal by directing a plasma torch into the furnace;

removing the molten metal thereby separated from a solid dross residue;

adding a solid chemical capable of reacting with the solid dross residue in the solid/solid state to insolubilize water soluble fluorides in the solid dross residue; and

removing the solid dross residue from the furnace.

4,960,461

METHOD AND INSTALLATION FOR EXTRACTING GOLD FROM GOLD ORE

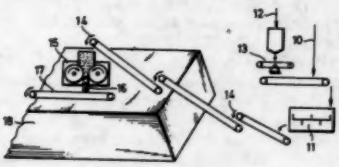
Mohammed Esna-Ashari, Bergisch-Gladbach; Hans Kellerwessel, Aachen; Ludwig Gemmer, and Gert-Helge Hamacher, both of Köln, all of Fed. Rep. of Germany, assignors to Klockner-Humboldt-Deutz AG, Fed. Rep. of Germany

Filed Oct. 27, 1988, Ser. No. 263,786

Claims priority, application Fed. Rep. of Germany, Oct. 27, 1987, 3736243

Int. Cl.[5] C22B *11/08, 1/24;* C01G *7/00*

U.S. Cl. 423—27 9 Claims



1. A method for extracting gold from gold ore comprising the steps:

pressing the ore by subjecting the ore to pressure in a two roll press in excess of 0.5 tons per centimeter of nip length causing product bed stressing being of sufficiently high pressure to generate interparticle crushing and to create hair-line cracks in the ore particles and to agglomerate the ore into scabs in the pressing;

adding a bonding agent to the gold ore before subjecting the ore to product bed stressing and interparticle crushing;

and leaching the scabs as soon as they are formed with a gold leaching agent which penetrates the cracks formed by said product bed stressing and interparticle crushing so that all of the steps occur simultaneously.

4,960,462

ACICULAR, FERROMAGNETIC METAL PARTICLES ESSENTIALLY CONSISTING OF IRON, AND THEIR PREPARATION

Michael W. Mueller, Plankstadt; Kalus-Dieter Hoppe, Wachenheim; Ekkehard Schwab, Neustadt; Werner Steck, Ludwigshafen; Helmut Auweter, Limburgerhof, and Rainer Feser, Gruenstadt, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Dec. 14, 1988, Ser. No. 284,246

Int. Cl.[5] H01F *1/047*

U.S. Cl. 75—252 1 Claim

1. Acicular, ferromagnetic metal particles having a coercive force greater than 100kA/m and a magnetization of not less than 120 nTm^3/g, measured in an external magnetic field of 160 kA/m, which particles consist essentially of iron; not more than 0.4% by weight, based on the total amount of the metal particles, of nickel; from 0.15 to 6.15% by weight, based on the amount of ferromagnetic metal, of zinc; from 0.17 to 10.76% by weight, based on the amount of ferromagnetic metal, of phosphorus in the form of phosphate ions; and from 1.54 to 6.76 by weight, based on the amount of ferromagnetic metal, of silicon in the form of SiO_2.

4,960,463

FLOOR POLISHING COMPOSITION

Oliver M. Brown, High Wycombe, England, assignor to S. C. Johnson & Son, Inc., Racine, Wis.

Continuation of Ser. No. 224,956, Jul. 27, 1988, abandoned, which is a division of Ser. No. 46,324, May 6, 1987, abandoned. This application Oct. 6, 1989, Ser. No. 418,953

Claims priority, application United Kingdom, May 23, 1986, 8612589

Int. Cl.[5] C09G *1/04, 1/00*

U.S. Cl. 106—11 2 Claims

1. In a method for using a polishing composition comprising a polymeric material and a surfactant, wherein the polymeric material provides the polishing composition, upon being applied to a substrate, with determinable physical properties, wherein said surfactant is an alkoxylated amine surfactant for improving said substrate-applied polishing composition physical properties, wherein the improvement method comprises:

combining with a polymeric material produced from a monomer selected from the group consisting of acrylic acid, butyl acrylate, ethyl acrylate, methyl acrylate, 2-ethyl hexyl acrylate, acrylonitrile, acrylamide, methacrylic acid, methyl methacrylate, ethyl methacrylate, butyl methacrylate, methacrylamide, styrene, alpha-methyl styrene, and combinations thereof, an effective amount of an alkoxylated alkyl amine surfactant having an alkyl chain of about 4 to about 40 carbon atoms and a nitrogen atom that can be substituted by 1, 2 or 3 alkoxy groups, each such alkoxy group having from 1 to about 4 carbon atoms, for producing a polishing composition that, upon being applied in the form of a film onto the substrate, possesses determinable 60 Degree Specular Gloss, level-surface, and depth-of-gloss values, wherein the amount of the alkoxylated alkyl amine surfactant relative to the amount of the polymeric material is effective for thus providing the substrate-applied film with said 60 Degree Specular Gloss, level-surface, and depth-of-gloss values and applying said composition to said substrate.

4,960,464

ERASABLE INK COMPOSITION

Ching-Fei Chen, No. 35-43, An-Si Li, Chia-Li Chiang, Tainan Hsien, Taiwan

Continuation-in-part of Ser. No. 239,589,. This application Aug. 31, 1989, Ser. No. 401,154
Int. Cl.[5] C09D *11/16, 13/00*
U.S. Cl. 106—19 1 Claim

1. An ink consisting of 17–20% by weight of a graphite powder, 17–20% by weight of a lubricating oil having a low viscosity and a low melting point, 44–47% by weight of oleic acid extracted from vegetable oil, 15–17% by weight of ethylene glycol, and 450–500 ppm of ferrous sulfate, the oleic acid and the ethylene glycol reacting with one another and serving as a carrier, and the ferrous sulfate catalyzing the reaction between the oleic acid and the ethylene glycol.

4,960,465

HYDRAULIC CEMENT ADDITIVES AND HYDRAULIC CEMENT COMPOSITIONS CONTAINING SAME

Ahmad Arfaei, Milford, N.H., assignor to W. R. Grace & Co., Cambridge, Mass.

Continuation-in-part of Ser. No. 939,647, Dec. 9, 1986, Pat. No. 4,814,014. This application Nov. 23, 1987, Ser. No. 121,898
The portion of the term of this patent subsequent to Mar. 21, 2006, has been disclaimed.
Int. Cl.[5] C04B *7/02, 7/36*
U.S. Cl. 106—724 37 Claims

1. A plasticized, flowable cementitious composition comprising a hydraulic cement and a graft copolymer plasticizer for said cement, said graft copolymer having an average molecular weight of less than about 50,000 and comprising a polyether backbone polymer and side chain polymers prepared by polymerization of an ethylenically unsaturated monomer.

4,960,466

COATING SOLUTIONS

Andrew J. Koplick, Victoria, Australia, assignor to Victorian Solar Energy Council, Victoria, Australia

PCT No. PCT/AU87/00324, § 371 Date Jul. 14, 1988, § 102(e) Date Jul. 14, 1988, PCT Pub. No. WO88/01988, PCT Pub. Date Mar. 24, 1988
PCT Filed Sep. 22, 1987, Ser. No. 236,672
Claims priority, application Australia, Sep. 22, 1986, 08135
Int. Cl.[5] C09D *5/00, 5/24*
U.S. Cl. 106—1.29 53 Claims

1. A coating solution of a composition consisting essentially of in admixture
(a) a solution of a cadmium compound
(b) a solution of tin compound
(c) a beta-diketone complexing agent, and
(d) at least one nitrogen-containing compound selected from the group consisting of ammonia, amine, and reaction products thereof.

4,960,467

DERMAL SUBSTANCE COLLECTION DEVICE

Carl C. Peck, Rockville, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Division of Ser. No. 116,763, Nov. 4, 1987, which is a continuation of Ser. No. 660,778, Oct. 8, 1985, Pat. No. 4,706,676. This application Dec. 12, 1988, Ser. No. 283,347
Int. Cl.[5] C08L *5/00*; A61B *5/00*; A61K *49/00*
U.S. Cl. 106—209 13 Claims

1. A gelled composition for the collection of a chemical substance from a dermal surface, said gelled composition consisting essentially of:
(a) A binding reservoir material, having a particle size in the colloid range, for binding with said dermal substance to prevent back transfer loss of said dermal substance from said binding reservoir to the dermal surface; and
(b) A liquid bridge transfer medium which comprises an aqueous gel that allows the instantaneous and continuous transfer of said dermal substance from the dermal surface

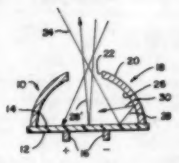
to said binding reservoir material being maintained in a wet-state by said liquid bridge transfer medium.

4,960,468

PHOTOVOLTAIC CONVERTER HAVING APERTURED REFLECTIVE ENCLOSURE

Ronald A. Sinton, Palo Alto, and Richard M. Swanson, Los Altos, both of Calif., assignors to The Board of Trustees of the Leland Stanford Junior University, Palo Alto, Calif.

Filed Oct. 20, 1988, Ser. No. 260,250
Int. Cl.[5] H02N *6/00*; H01L *31/04*
U.S. Cl. 136—259 13 Claims



1. A photovoltaic converter, comprising:
a photovoltaic cell having an incident face upon which light is directed to cause photogeneration;
an enclosure over the incident face, the wall of the enclosure having a reflective inner surface spaced apart from the incident face to permit light reflected from the incident face to be re-reflected by the inner surface and back to the photovoltaic cell; and
an aperture through the wall of the enclosure to permit light to fall directly upon the voltaic cell, the ratio of the area of the aperture to the area of the incident face of the photovoltaic cell being less than about 0.2.

4,960,469

METHOD OF MANUFACTURING MAGNETICALLY ANISOTROPIC MAGNET MATERIALS AND DEVICE FOR SAME

Shigeho Tanigawa, Honosu; Katsunori Iwasaki, Kumagaya, and Yasuto Nozawa, Kumagaya, all of Japan, assignors to Hitachi Metals, Ltd., Tokyo, Japan

Filed Nov. 23, 1988, Ser. No. 274,570
Claims priority, application Japan, Nov. 27, 1987, 62-299200
Int. Cl.[5] H01F *1/02*
U.S. Cl. 148—105 10 Claims

1. A method of manufacturing an integral, radially magnetically anisotropic, columnar ring-shaped magnet material, the magnet having inner and outer diameter, comprising the steps of selecting an alloy composed of rare earth metal, transition metal and boron and whose average crystal grain size ranges from 0.01 to 0.5 μm; preparing a powder or flake material of amorphous and/or fine crystal grains obtained by rapidly quenching the molten alloy; compacting the powder or flake material to thereby obtain a compact, or a densified compact which is formed by warm-densifying the compact, the compact or densified compact having an outer periphery; imparting radial magnetic anisotropy to the compact or to the densified compact by plastically deforming it to provide an inner diameter and to provide plastic material flow in the radially

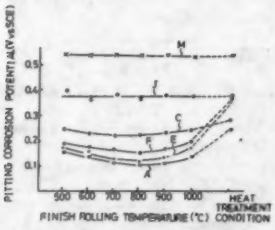
inward direction simultaneously around substantially the entire outer periphery while maintaining said inner diameter, and while maintaining the compact or densified compact at a temperature of 600° to 850° C.; and subsequently magnetizing the deformed compact to the desired radial or polar pattern of magnetization.

4,960,470

METHOD FOR MANUFACTURING A HIGH STRENGTH STAINLESS STEEL

Yoshinobu Honkura, Kounan; Yoshihiro Nakashima; Toru Matsuo, both of Tokai, and Kouji Murata, Tokai, all of Japan, assignors to Aichi Steel Works, Ltd., Tokai, Japan

Division of Ser. No. 716,442, Mar. 26, 1985, abandoned. This application Apr. 11, 1989, Ser. No. 340,142
Claims priority, application Japan, Mar. 30, 1984, 59-64845
Int. Cl.[5] C21D *8/00*
U.S. Cl. 148—12 E **11 Claims**



1. A method for manufacturing high-strength, hot worked stainless steel having a recrystallized microstructure, which method comprises the steps of:

preparing a steel comprising by weight, not more than 0.03% carbon, not more than 2.00% silicon, not more than 5.0% manganese, not more than 0.030% sulfur, 6–13% nickel, 16–20% chromium, 0.15–0.28% nitrogen, 0.05–0.25% niobium, not more than 0.0020% boron, the remainder being iron together with impurities;

heating said steel at temperatures of 950–1,300° C;

rolling said steel at temperatures of 900–1,250° C;

controlling the temperatures of finishing rolling for said steel at 900–1,000° C.;

cooling said steel after said rolling at the rate not less than 4° C./min; and

the total forming ratio of said steel being not less than 30%.

4,960,471

CONTROLLING THE OXYGEN CONTENT IN TANTALUM MATERIAL

James A. Fife, Douglassville, and Robert A. Hard, Oley, both of Pa., assignors to Cabot Corporation, Waltham, Mass.

Filed Sep. 26, 1989, Ser. No. 412,419
Int. Cl.[5] C21D *1/00*
U.S. Cl. 148—20.3 **8 Claims**

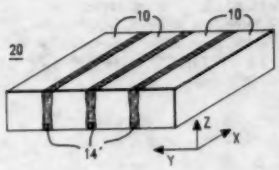
1. A process for controlling the oxygen content in tantalum material comprising heating said material at a temperature ranging from about 900° C. to about 2400° C. under a hydrogen-containing atmosphere in the presence of a getter composite comprising a getter metal encapsulated in tantalum wherein said getter metal is more oxygen active than the tantalum material.

4,960,472

ANISOTROPIC RESISTIVITY MATERIAL AND METHOD OF MAKING SAME

Gerald J. Bruck, Murrysville; Raymond A. Hilgert, Verona, and Graham A. Whitlow, Murrysville, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 30, 1988, Ser. No. 292,180
Int. Cl.[5] C21D *8/00*
U.S. Cl. 148—127 **11 Claims**



1. A method of making an anisotropic resistivity body comprising the steps of:

(A) providing a plurality of sections of a first metal;

(B) placing a plurality of relatively thin sections of a metal insert between said sections of said first metal, said first metal and said metal insert having different compositions;

(C) passing over each said section of said metal insert with a high energy beam so as to cause on each said pass an alloyed zone comprised of said first metal and metal insert; and

(D) removing any undesired excess metal so as to form a body having first and second opposed surfaces and alternate zones of different resistivity wherein each of said alloyed zones extend all the way from said first to said second surface.

4,960,473

PROCESS FOR MANUFACTURING STEEL FILAMENT

Dong K. Kim, Akron, and Robert M. Shemenski, North Canton, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Oct. 2, 1989, Ser. No. 415,948
Int. Cl.[5] C21D *8/06*
U.S. Cl. 148—12 B **18 Claims**

1. A process for manufacturing steel filament which has an outstanding combination of strength and ductility which comprises the sequential steps of (1) heating a steel wire in a first patenting step to a temperature which is within the range of about 900° C. to about 1100° C. for a period of at least about 5 seconds, wherein said steel wire consists essentially of (a) about 96 to about 99.1 weight percent iron, (b) about 0.6 to about 1 weight percent carbon, (c) about 0.1 to about 1.2 weight percent manganese, (d) about 0.1 to about 1 weight percent silicon, and (e) about 0.1 to about 0.8 weight percent chromium; (2) rapidly cooling said steel wire to a temperature which is within the range of about 540° C. to about 620° C. within a period of less than about 4 seconds; (3) maintaining said steel wire at a temperature within the range of about 540° C. to about 620° C. for a period which is sufficient for the microstructure of the steel in the steel wire to transform to an essentially body centered cubic microstructure; (4) cold drawing the steel wire to a draw ratio which is sufficient to reduce the diameter of the steel wire by about 40 to about 80%: (5) heating the steel wire in a second patenting step to a temperature which is within the range of about 900° C. to about 1100° C. for a period of at least about 1 second; (6) rapidly cooling said steel wire to a temperature which is within the range of about 540° C. to about 620° C. within a period of less than about 4 seconds: (7) maintaining said steel wire at a temperature within the range of about 540° C. to about 620° C. for a period which is sufficient for the microstructure of the steel in the steel wire to

transform to an essentially body centered cubic microstructure; and (8) cold drawing the steel wire to a draw ratio which is sufficient to reduce the diameter of the steel wire by about 60 to about 98% to produce said steel filament.

4,960,474

GALLIUM-CONTAINING MAGNET FOR A MOTOR

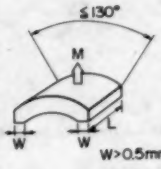
Yasuto Nozawa, Kumagaya; Shigeho Tanigawa, Konosu, and Katsunori Iwasaki, Kumagaya, all of Japan, assignors to Hitachi Metals, Ltd., Tokyo, Japan

Filed Sep. 8, 1988, Ser. No. 241,735

Claims priority, application Japan, Sep. 9, 1987, 62-225892

Int. Cl.[5] H01F *1/053*

U.S. Cl. 148—302 **10 Claims**



1. A magnetically anisotropic magnet for use in a motor, formed from a material comprising at least one rare earth element (R), Fe and boron (B), and further comprising Ga added in an amount at least 0.001 at %, said magnet having fine crystal grains, said magnet also having a surface magnification of not less than 6, a residual magnetic flux density in the direction of easy magnetization of not less than 11 kG and a coercive force of not less than 12 kOe.

4,960,475

SURFACTANT FOR GASSED EMULSION EXPLOSIVE

Don H. Cranney, 10535 S. Featherwood, South Jordan, Utah 84065, and Blake T. Maxfield, 6614 S. 5095 West, West Jordan, Utah 84084

Filed Mar. 20, 1990, Ser. No. 496,008

Int. Cl.[5] C06B *45/00*

U.S. Cl. 149—2 **16 Claims**

1. A water-in-oil emulsion explosive comprising an organic fuel as a continuous phase; an emulsified inorganic oxidizer salt solution or melt as a discontinuous phase; an emulsifier; a chemical gassing agent soluble in the oxidizer salt solution and a surfactant soluble or dispersible in the oxidizer salt solution for increasing the rate of gas generated by the chemical gassing agent.

4,960,476

METHOD OF MAKING A BELT CONSTRUCTION AND ROTATABLE PULLEY COMBINATION

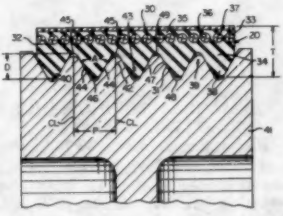
Jack D. White, Jr., and Clinton L. Bishop, both of Springfield, Mo., assignors to Daycon Products, Inc., Dayton, Ohio

Filed Feb. 21, 1989, Ser. No. 312,280

Int. Cl.[5] F16G *1/28, 5/20*

U.S. Cl. 156—138 **10 Claims**

7. In the method of making an endless power transmission belt construction having opposed side edge means and having an inner surface means defining a plurality of longitudinally disposed and alternately spaced apart like projections and grooves for meshing with an outer peripheral ribbed surface means of a rotatable pulley means, said method comprising the step of forming each projection of said belt construction to have a generally V-shaped transverse crosssectional configuration defined by two substantially straight side edges that converge from the respective apexes of said grooves of said belt construction that are on opposite sides of that projection to an apex of that projection, the improvement comprising the step of forming said side edges of each said projection of said belt construction in the relaxed condition thereof to define an angle of approximately 60° therebetween with the thickness of said belt construction in the relaxed condition thereof being substantially the same as the thickness of a similar belt construc-



tion in the relaxed condition thereof wherein said angle is approximately 40° and with the distance between the centerlines of said grooves of said belt construction that are on opposite sides of that projection being larger than such distance of said similar belt construction.

4,960,477

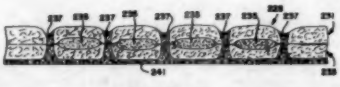
DISPOSABLE DIAPER WITH FOLDED ABSORBENT BATT

Frederick K. Mesek, San Diego, Calif., assignor to McNeil-PPC, Inc., Milltown, N.J.

Continuation of Ser. No. 28,411, Mar. 18, 1987, abandoned, which is a division of Ser. No. 726,040, Apr. 22, 1985, Pat. No. 4,670,011, which is a continuation-in-part of Ser. No. 557,190, Dec. 1, 1983, abandoned. This application Jan. 24, 1989, Ser. No. 302,038

Int. Cl.[5] B32B *7/00*

U.S. Cl. 156—209 **26 Claims**



1. A method of manufacturing a disposable diaper, comprising the steps of:

forming first and second fibrous webs of highly porous cellulosic fibrous material;

depositing a quantity of highly liquid-sorbent superabsorbent material on said second fibrous web on at least a medial section thereof to provide a plurality of spaced apart discrete regions of superabsorbent material;

positioning facing surfaces of said first and second fibrous webs in superposed relation to define a web interface therebetween at which said discrete regions of superabsorbent material are provided to thereby form a fibrous batt having a medial section corresponding to the medial section of said second fibrous web;

joining said first and second fibrous webs to each other, including forming a plurality of densified compacted wicking embossments between and adjacent to, but spaced from, said discrete regions of superabsorbent material to promote wicking of liquid, said joining step being performed so that said densified embossments comprise integrated fibrous material of said first and second fibrous webs for joining said webs to each other to integrate said fibrous webs for stabilizing said fibrous batt formed therefrom; and

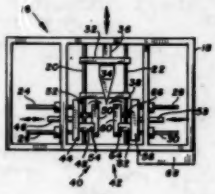
providing a first outer backing sheet and a second moisture-pervious facing sheet on respective opposite sides of said fibrous batt in superposed relation therewith.

4,960,478

APPARATUS AND PROCESS FOR THE FUSION BONDING OF THERMOPLASTIC ARTICLES

Raymond K. Newkirk, Mound, and David G. Holker, Robbinsdale, both of Minn., assignors to Tape Inc., Minneapolis, Minn.

Filed May 14, 1987, Ser. No. 49,598
Int. Cl.[5] B29C *65/20*
U.S. Cl. 156—228 11 Claims



1. An apparatus for the fusion bonding of thermoplastic articles, including:

a frame having a central longitudinal axis;

first and second article support members movably mounted with respect to said frame for supporting, respectively, first and second thermoplastic articles in opposed relation and on opposite sides of a fusion plane including said longitudinal axis, and further with each of said thermoplastic articles in a select orientation with respect to its associated article support member;

an article heating member and means forming first and second heating surfaces on opposite sides of and having a select orientation, with respect, to said fusion plane, and a heating member moving means for reciprocating said heating member along said longitudinal axis between forward and rearward heater positions with respect to said article support members;

a first article moving means drivably associated with said first support member for reciprocating said first thermoplastic article toward and away from said fusion plane and for pivoting said first thermoplastic article between a first open position in which a first bonding surface of said first article is substantially aligned with said first heating surface, and a first closed position in which said first bonding surface is substantially aligned with said fusion plane;

a second article moving means drivably associated with said second article support member for reciprocating said second thermoplastic article toward and away from said fusion plane, and for pivoting said second thermoplastic article between a second open position wherein a second bonding surface of said second article is substantially aligned with said second heating surface, and a second closed position wherein said second bonding surface is aligned with said fusion plane; and

a guide means between said heating member and said article support members for limiting movement of said thermoplastic articles towards one another and towards said closed positions responsive to the force of their associated said article moving means to thus position the bonding surface of each thermoplastic article against its associated said heating surface when said heating member is in said forward position, and further to cause a controlled movement of each thermoplastic member toward said fusion plane and toward its closed position responsive to the force of its associated said article moving means as said heating member moves rearwardly, with each of said thermoplastic articles moving to its closed position to place said bonding surfaces in contiguous relation upon movement of said heating member to said rearward position.

10. A process for the fusion bonding of thermoplastic articles including the steps of:

supporting first and second thermoplastic articles in spaced apart relation on opposite sides of a fusion plane;

positioning first and second heating surfaces on opposite sides of said fusion plane and between said first and second thermoplastic articles, in an inclined relation to said fusion plane, with said heating surfaces at least proximate each other at forward ends thereof, and diverging from one another in a rearward direction;

positioning respective bonding surfaces of said first and second thermoplastic articles against said first and second heating surfaces, respectively, with the bonding surface of each thermoplastic article in surface engagement with its associated one of said heating surfaces;

transferring heat from each heating surface to its associated thermoplastic article while said articles and heating surfaces are so engaged, thereby causing the bonding surfaces of said articles to become fused;

following heating, moving said heating surfaces along a longitudinal axis in said fusion plane and away from between said thermoplastic articles, and simultaneously moving said articles toward one another until said heating surfaces are free of said articles and said articles engage one another along their respective fused bonding surfaces; and

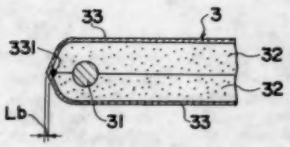
maintaining said thermoplastic articles in contact with one another until bonding is complete.

4,960,479

METHOD FOR MANUFACTURING AN AUTOMOBILE SUNVISOR

Yoshikazu Yasuda; Kazuaki Tsubota, and Shiro Tanimoto, all of Hiroshima, Japan, assignors to Delta Kogyo Co., Ltd., Hiroshima, Japan

Continuation of Ser. No. 7,192,705, May 11, 1988, abandoned. This application Jan. 22, 1990, Ser. No. 469,672
Claims priority, application Japan, May 15, 1987, 62-119847; Oct. 28, 1987, 62-274024
Int. Cl.[5] B32B *31/18*
U.S. Cl. 156—251 1 Claim



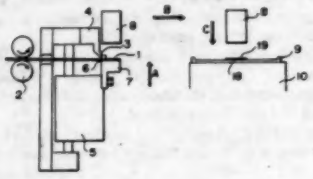
1. A method for manufacturing an automobile sunvisor by compressing a pair of overcoatings between an upper electrode member and a lower electrode member to form a bead of thermoplastic resin along an inside edge of an outer periphery of the overcoatings wherein a blade edge having a sharpened tip with an inside slope and outside slope is formed in said upper electrode member along the outer periphery of said pair of overcoatings, said inside slope forming a first angle with respect to a receiver seat positioned on said lower electrode member and said outside slope forming a second angle with respect to said receiver seat, said first angle being larger than said second angle, said method comprising the steps of welding the pair of overcoatings between said inside slope and a flat surface of said lower electrode member confronting the inside slope; cutting said pair of overcoatings at a position where said blade edge is in substantially continuous contact with said receiver seat and along a length with the application of a depressing force having a predetermined force per every 1 mm unit of the length cut subsequent to being welded with application of the depressing force in the range of 9 ± 1.0 kg/cm^2; and, retaining said bead of thermoplastic resin in the first angle so as to secure the welding of said pair of overcoatings by a predetermined protruded width.

4,960,480

METHOD OF AND SYSTEM FOR ASSEMBLING MAGNETIC DISK CARTRIDGE

Shoji Iwamoto, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Mar. 8, 1989, Ser. No. 320,654
Claims priority, application Japan, Mar. 8, 1988, 63-54615
Int. Cl.[5] B32B *31/18*
U.S. Cl. 156—256 2 Claims



1. A method of assembling a magnetic disk cartridge comprising a magnetic disk sheet accommodated in a casing in such a way that it may be rotated, said casing having a wear-resistant member applied to a central portion of the inner surface thereof, the method comprising steps of

applying heat-sensitive adhesive to one side of a raw sheet material composed of the same material as the wear-resistant member,

cutting the raw sheet material into wear-resistant members,

heating each wear-resistant member in order to melt the heat-sensitive adhesive while supporting the wear-resistant member with a suction force,

releasing the wear-resistant member while the heat-sensitive adhesive is in a molten state, and

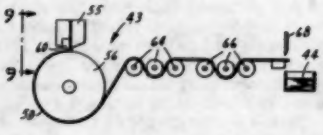
applying the wear-resistant member to the central portion of the inner surface of the casing.

4,960,481

LAMINATING METHOD

Mark D. Sorlien, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Division of Ser. No. 312,718, Feb. 21, 1989, Pat. No. 4,929,029, which is a division of Ser. No. 57,214, May 8, 1987, Pat. No. 4,821,359. This application Jun. 16, 1989, Ser. No. 367,233
Int. Cl.[5] B32B *31/20*
U.S. Cl. 156—272.4 3 Claims



1. A method of laminating comprising the steps of:

providing individual plies made of chipboard and coated with adhesive, which adhesive has been dried and is activatable by the application of water;

exposing the plies to atmospheric moisture so that the chipboard contains moisture;

pressing the adhesive coated plies together; and

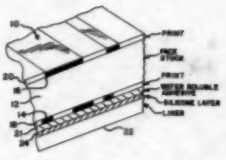
radiating the pressed adhesive coated plies with radio frequency energy so that the moisture in the chipboard is heated and is driven from the chipboard into the adhesive to soften the adhesive and the softened adhesive bonds the plies together.

4,960,482

APPARATUS AND METHOD FOR MANUFACTURE OF ADHESIVE LABEL

John S. Crane, Savannah, Ga., and Dean A. Strauss, De Pere, Wis., assignors to Belmark, Inc., De Pere, Wis.

Continuation-in-part of Ser. No. 222,041, Jul. 20, 1988, abandoned, which is a continuation-in-part of Ser. No. 71,122, Jul. 8, 1987, abandoned. This application Feb. 13, 1989, Ser. No. 310,291
Int. Cl.[5] B32B *31/00*
U.S. Cl. 156—277 3 Claims



1. A method of manufacturing a printed pressure sensitive label, said method comprising:

applying an ink layer in a printed pattern to a sheet of stock;

curing said ink at a first temperature;

applying an aqueous adhesive layer to said cured ink layer over substantially all of said sheet; and

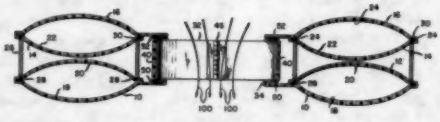
curing said adhesive at a second temperature substantially higher than said first temperature in order to prevent said ink from running.

4,960,483

HEAT PRESSING APPARATUS FOR MAKING AN INFLATABLE LIFE VEST AND METHOD FOR USE THEREOF

Stanley Switlik, Pennington, N.J., assignor to Switlik Parachute Company, Inc., Trenton, N.J.

Filed Jun. 26, 1989, Ser. No. 373,011
Int. Cl.[5] B30B *5/02, 15/34;* B32B *31/20*
U.S. Cl. 156—290 30 Claims



1. A method for making a pneumatically inflatable life vest comprising:

(a) placing a first layer of pneumatically impervious material onto a heat sealing station;

(b) placing a second layer of pneumatically impervious material in abutting contact with the first layer thereof;

(c) positioning a first body sealing edge of a heat sealing body jig in abutment with respect to the second layer of material, the heat sealing body jig further including a second body sealing edge;

(d) placing a third layer of pneumatically impervious material upon the heat sealing body jig in abutment with respect to the second body sealing edge thereof;

(e) placing a fourth layer of pneumatically impervious material in abutting contact with respect to the third layer thereof;

(f) wrapping a neck member around a neck sealing jig with the neck member extending over a first neck sealing edge and a second neck sealing edge defined on the neck sealing jig, the neck member defining an opened center therein;

(g) positioning the neck sealing jig between the first layer and the fourth layer of pneumatically impervious material

with the first neck sealing edge adjacent the first layer and the second neck sealing edge adjacent the fourth layer;

(h) heat pressing to simultaneously heremetically seal:

(1) the first layer with respect to the second layer along the first body sealing edge of the heat sealing body jig to form a first sealed chamber;

(2) the third layer with respect to the fourth layer along the second body sealing edge of the heat sealing body jig to form a second sealed chamber;

(3) the first layer with respect to the neck member along the first neck sealing edge of the neck sealing jig;

(4) the neck member with respect to the fourth layer along the second neck sealing edge of the neck sealing jig to form a neck gusset being attached with respect to the first and second sealed chambers;

(i) removing the first layer, second layer, third layer, fourth layer and neck member from the heat sealing station; and

(j) moving the first sealed chamber formed by the first layer being sealed with respect to the second layer through the opened center of the neck member to turn the neck member inside out to minimize contact of heat sealed seams with respect to the neck of the user.

16. A heat pressing apparatus for use in making a pneumatically inflatable life vest from a neck member and first, second, third and fourth layers of pneumatically impervious material comprising:

(a) a heat sealing body jig including:

(1) a main body section;

(2) a first body sealing edge adapted to be positioned adjacent first and second layers of material oriented in abutting contact with respect to one another to facilitate heat sealing therebetween;

(3) a second body sealing adapted to be positioned adjacent third and fourth layers of material oriented in abutting contact with respect to one another to facilitate heat sealing therebetween;

(b) a neck sealing jig positioned adjacent said heat sealing body jig and adapted to receive the neck member extending thereover, said neck sealing jig including:

(1) a main neck section;

(2) a first neck sealing edge oriented extending toward the first and second layers and adapted to be covered by the neck member to facilitate heat sealing attachment thereof with respect to the first and second layers of pneumatically impervious material simultaneously with heat sealing of the first and second layers with respect to one another; and

(3) a second neck sealing edge oriented extending toward the third and fourth layers and adapted to be covered by the neck member to facilitate heat sealing attachment thereof with respect to the third and fourth layers of pneumatically impervious material simultaneously with heat sealing of the third and fourth layers with respect to one another.

4,960,484

SINGLE-SIDE LAMINATOR

Michael T. King, Palatine, and Neal E. Petges, Chicago, both of Ill., assignors to General Binding Corporation, Northbrook, Ill.

Continuation of Ser. No. 119,718, Nov. 12, 1987, abandoned. This application Jan. 26, 1989, Ser. No. 302,086

Int. Cl.[5] B32B *31/00*

U.S. Cl. 156—499 **1 Claim**

1. An attachment for a machine for heat laminating a protective film to one side of an underlying product to be protected, which machine includes;

roller means for dispensing laminating protective film;

heat shoe means over which film is drawn for heating laminating film to a predetermined laminating temperature;

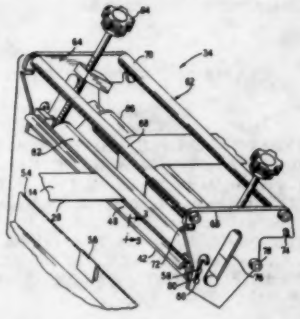
means for dispensing unprotected product to be protected by laminating;

nip roller means for laminating film and product together with the film on one side and product on the other side of the laminate, said laminate forming a web having an initial curl; and

pull roller means for drawing laminated web from said nip roller means for directing laminated web from said machine;

wherein the improvement comprises:

one-side laminate attachment means downstream of said nip roller means and upstream of said pull roller means for receiving laminated web from said nip roller means, said attachment means, including: a stationary bar over which laminated web is drawn for applying a reverse curling force to laminated web; adjustable roller means around which laminated web from said bar means is trained for cooperation in adjustably drawing laminated web from the adjustable roller means and directing laminated web from said attachment means toward said pull roller means;



said attachment means also including;

a pair of spaced attachment side plates for mounting cooperating with said machine, for carrying said adjustable roller means, and for carrying said stationary roller means; and

adjustment means mounted to said attachment plates and to said adjustable roller means for adjusting the position of the adjustable roller means in relation to the stationary bar so as to adjust the position of a laminated web relative to said stationary bar and the reverse curling force applied to the laminated web;

wherein said side plates each define an inverted J-shaped slot having a pair of legs and a bight, and the stationary bar includes at each end a pair of spaced mounting pins, said pins adapted to be received in the respective inverted J-shaped slot, wherein the pins are movable in the legs and bight of the slots between an operative position and an installation position.

4,960,485

AUTOMATIC WAFER MOUNTING DEVICE

Yusaku Ichinose, Ome, and Hitoshi Imamura, Kofu, both of Japan, assignors to Enya Mfg. Co., Ltd., Saitama, Japan

Filed May 27, 1988, Ser. No. 200,042

Claims priority, application Japan, Jun. 19, 1987, 62-151352

Int. Cl.[5] B65H *5/04, 5/18*

U.S. Cl. 156—556 **19 Claims**

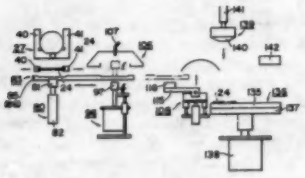
1. A wafer mounting device comprising:

carrying means for transferring wafers, and adhering the wafers one by one onto a polishing plate;

spin chuck means which is provided for upward and downward movement for receiving wafers from the carrying means during the upward movement thereof, turning the wafers at an upward position of the spin chuck means, and replacing wafers to said carrying means during the downward movement;

an adhesive agent coating means provided at an upper portion of said spin chuck means for dripping adhesive agent on to said wafers;

a reverse chuck means for inverting the side of the wafers on which adhesive agent is coated and for ejecting outwardly said wafers from the carrying means; and



means for holding said polishing plate at a predetermined place so as to adhere the wafers ejected from said carrying means in inverted position onto a surface of said polishing plate.

4,960,486

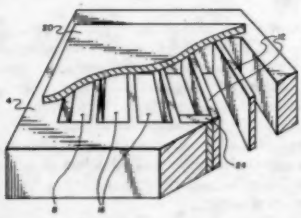
METHOD OF MANUFACTURING RADIATION DETECTOR WINDOW STRUCTURE

Raymond T. Perkins; James M. Thorne; Larry V. Knight, and Richard C. Woodbury, all of Provo, Utah, assignors to Brigham Young University, Provo, Utah

Division of Ser. No. 202,468, Jun. 6, 1988, Pat. No. 4,933,557. This application Feb. 23, 1990, Ser. No. 483,796

Int. Cl.[5] H01L *21/306;* **B44C** *1/22;* **C03C** *15/00, 25/06*

U.S. Cl. 156—633 **9 Claims**



1. A method of making a radiation entrance window of a radiation detector comprising

forming a plurality of spaced-apart beams, the tops of which generally define a plane,

forming a thin film of material capable of passing radiation to be detected and of blocking unwanted radiation, and

wherein the film is secured on the tops of the beams.

4,960,487

PROCESS FOR MAKING MICROWAVE ENERGY ATTENUATING CIRCUITS

Jean-Claude Ragotin, Limours, France, assignor to Thomson-CSF, Puteaux, France

Filed Oct. 27, 1989, Ser. No. 427,376

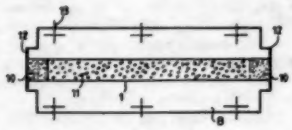
Int. Cl.[5] B44C *1/22;* **C23F** *1/02;* **C03C** *15/00, 25/06*

U.S. Cl. 156—643 **4 Claims**

1. A process for making microwave energy attenuating circuits, said process comprising the steps of:

providing conductive metal elements on which microwave currents flow; and

roughening the surfaces of the conductive elements on which the currents flow, by performing an attack of the metal constituting the walls of the conductors, whereby



surfaces of said walls exhibit a granular appearance after the attack of the metal which constitutes the surfaces.

4,960,488

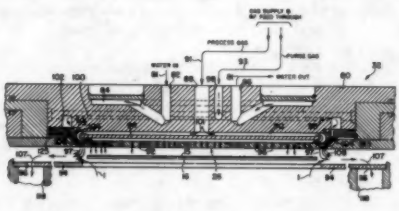
REACTOR CHAMBER SELF-CLEANING PROCESS

Kam S. Law, Union City; Cissy Leung, Fremont; Ching C. Tang, San Francisco; Kenneth S. Collins, San Jose; Mei Chang, Cupertino; Jerry Y. K. Wong, Union City, and David Nin-Kou Wang, Cupertino, all of Calif., assignors to Applied Materials, Inc., Santa Clara, Calif.

Continuation of Ser. No. 67,210, Jun. 26, 1987, abandoned, which is a continuation-in-part of Ser. No. 944,492, Dec. 19, 1986, Pat. No.

Int. Cl.[5] B08B *7/00;* **C23F** *1/12;* **H01L** *21/306*

U.S. Cl. 156—643 **16 Claims**



1. A process for self-cleaning a reactor chamber, comprising:

providing a gas inlet manifold electrode and an adjacent, parallel wafer support electrode having adjustable spacing therebetween,

communicating into the chamber via the gas inlet manifold electrode a gas mixture comprising fluorocarbon gas while applying RF power between the gas inlet manifold electrode and the wafer support electrode while maintaining the chamber at a sufficiently high pressure within the range of about 2–15 torr, for forming an etching plasma of the gas mixture with the gas inlet manifold electrode and wafer support electrode at a first spacing, selected for locally etching deposits from at least the gas inlet manifold electrode and the wafer support electrode, and

communicating into the chamber via the gas inlet manifold electrode a fluorinated gas while applying RF power between the gas inlet manifold electrode and the wafer support electrode for forming an etching plasma of the fluorinated gas and while maintaining the chamber at a pressure within the range of about one-half torr to one torr and the manifold electrode and the wafer support electrode at a second selected spacing greater than the first spacing for etching substantially throughout the chamber.

4,960,489

METHOD FOR SELF-ALIGNED MANUFACTURE OF CONTACTS BETWEEN INTERCONNECTS CONTAINED IN WIRING LEVELS ARRANGED ABOVE ONE ANOTHER IN AN INTEGRATED CIRCUIT

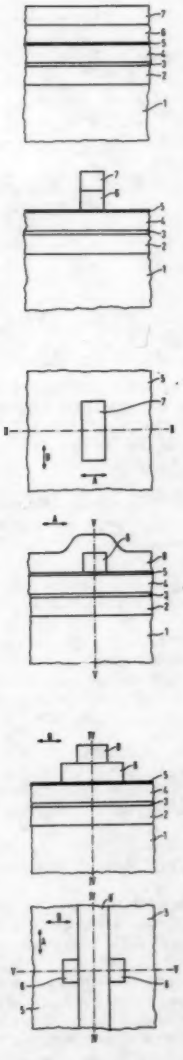
Guenther Roeska, Holzkirchen; Josef Winnerl, and Franz Neppl, both of Munich, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Dec. 18, 1989, Ser. No. 451,987

Claims priority, application European Pat. Off., Dec. 16, 1988, 8812168

Int. Cl.[5] B44C *1/22*; C23F *1/02*; C03C *15/00, 25/06*

U.S. Cl. 156—652 **10 Claims**



1. A method for manufacturing a contact between interconnects contained in wiring levels arranged above one another in an integrated circuit, comprising steps of:

providing a layer structure that contains at least a first conductive layer for a lower interconnect to be later formed, and at least one further conductive layer for the contact;

etching a longitudinal expanse of the contact by use of a mask such that portions of the longitudinal expanse overlap a given width of the lower interconnect to be later formed;

etching a lateral expanse of the contact by use of another mask used for later forming the lower interconnect, the lateral expanse of the contact being etched before the lower interconnect is formed with said another mask; and

etching the lower interconnect.

4,960,490

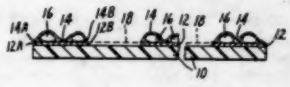
METHOD OF MAKING MULTIPLE-CONNECTOR ADHESIVE TAPE

James G. Berg, and Robert S. Reylek, both of St. Paul, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 7,073,896, Jul. 13, 1987, which is a continuation of Ser. No. 869,250, Jun. 2, 1986, abandoned, which is a continuation of Ser. No. 503,579, Jun. 13, 1983, abandoned. This application Oct. 17, 1988, Ser. No. 258,615

Int. Cl.[5] B44C *1/22*; C23F *1/02*

U.S. Cl. 156—656 **15 Claims**



1. Method of making a multiple-connector tape comprising the steps of

(1) applying an electrically conductive layer onto a nonconductive backing,

(2) applying a pattern of adhesive bands onto the electrically conductive layer, which adhesive affords bonds to glass plate, said adhesive having a shear strength exceeding 20 kPa, and which contain electrically-conductive particles comprising 0.1 to 40 volume percent of each adhesive band, and

(3) removing the electrically conductive layer portions between adjacent overlying adhesive bands to provide a pattern of longitudinally electrically conductive stripes, each edge of which is precisely followed by an edge of the overlying adhesive band.

4,960,491

PROCESS FOR ETCHING ORGANIC POLYMERIC MATERIALS

Henry G. Youlton, Southampton, United Kingdom, assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 10, 1990, Ser. No. 463,248

Claims priority, application United Kingdom, Jan. 13, 1989, 89007801

Int. Cl.[5] B44C *1/22*; B29C *37/00*; C03C *15/00, 25/06*

U.S. Cl. 156—668 **7 Claims**

1. A process for etching an organic polymeric material by reaction with an etching solution, characterized in that the reaction is promoted by the said solution also interacting with a reactive material to generate hydrogen.

4,960,492

COMMON WIRE PATH OF A WET END SECTION OF A TWIN WIRE PAPER MAKING MACHINE

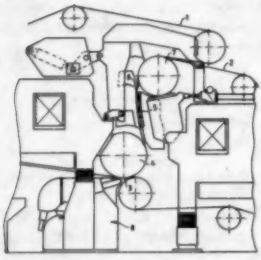
Wolfgang Weitzel, and Dieter Egelhof, both of Heidenheim, Fed. Rep. of Germany, assignors to J.M. Voith GmbH, Fed. Rep. of Germany

Filed Feb. 3, 1989, Ser. No. 306,514

Claims priority, application Fed. Rep. of Germany, Feb. 9, 1988, 3803805

Int. Cl.[5] D21F 1/00

U.S. Cl. 162—301 16 Claims



1. A wet end section of a paper making machine, comprising:

a pair of paper machine wet end section wires including an inner wire forming a first wire loop and an outer wire cooperating with the inner wire and forming a second wire loop;

means for supplying stock for dewatering and including a stock outlet;

a forming cylinder arranged inside the first loop of the inner wire so that the inner wire wraps partially around the forming cylinder; means for directing the outer wire to meet the inner wire at the forming cylinder for defining a feed nip at the forming cylinder, and the stock outlet being directed to dispense stock into the feed nip; the wires having a common path of movement from the feed nip and along the outer surface of the forming cylinder which deflects the wires in a first direction;

a first curved surface following the forming cylinder, the common path of the wires extending over the first curved surface, the first curved surface being inside the loop of the outer wire, the first curved surface being shaped and oriented such that the wire path is curved in a second direction opposite the first direction of curvature of the wire path around the forming cylinder;

a second curved surface further along the common path of the wires past the first curved surface, said second curved surface being disposed inside the loop of the inner wire, the common path of the wires extending over the second curved surface, the second curved surface being so curved and positioned that the wires moving along the common path past the second curved surface are deflected in the first direction opposite to the second direction of curvature of the wires passing over the first curved surface; the length of the second curved surface along the common path of the wires being substantially 1/10 or less of the length of the first curved surface along the common path of the wires;

a doctor blade carrier supported in the wet end section and inside the first loop of the inner wire and extending across the common path of the wires, the second curved surface being defined on the doctor blade carrier; the doctor blade carrier being tiltable with respect to the wires for moving the second surface selectively further into and out of the common path of the wires, such that the second surface is movable to deflect the wires selectively more or less in said first direction;

a suction roll located inside the second loop of the outer wire, the suction roll being disposed along the common path of the wires past the second curved surface, the common path of the wires extending over the outer surface of the suction roll; and

means supporting the wires for separating into the respective first and second loops following the second curve surface.

4,960,493

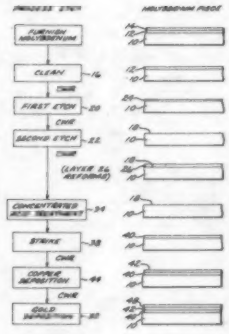
PLATING ON METALLIC SUBSTRATES

Sue Troup, Calabasas, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Continuation-in-part of Ser. No. 223,205, Jul. 22, 1988, abandoned. This application Apr. 3, 1989, Ser. No. 332,926

Int. Cl.[5] C25D 5/38, 5/10

U.S. Cl. 204—32.1 16 Claims



11. A process for depositing copper onto the surface of a molybdenum substrate, comprising the steps of:

providing a molybdenum substrate;

cleaning the surface of the substrate;

etching the surface of the substrate to remove gross oxide from the surface;

placing the surface of the substrate into concentrated hydrochloric acid with the substrate made cathodic;

transferring the substrate from the hydrochloric acid into a gold-containing strike solution while maintaining the cathodic potential on the substrate and maintaining the gold-containing strike solution at an elevated temperature above ambient;

depositing a gold strike layer onto the substrate from the strike solution with the substrate cathodic; and

depositing copper onto the substrate overlying the gold strike layer.

4,960,494

CERAMIC/METAL COMPOSITE MATERIAL

Thinn Nguyen, Onex; Abdelkrim Lazouni, Geneva, and Kim S. Doan, Onex, all of Switzerland, assignors to MOLTECH Invent S.A., Luxembourg

PCT No. PCT/EP88/00785, § 371 Date Apr. 28, 1989, § 102(e) Date Apr. 28, 1989, PCT Pub. No. WO89/01991, PCT Pub. Date Mar. 9, 1989

PCT Filed Aug. 30, 1988, Ser. No. 350,480

Claims priority, application Austria, Sep. 2, 1987, 810503/87

Int. Cl.[5] C25C 3/06, 7/02

U.S. Cl. 204—67 13 Claims

1. A ceramic/metal composite material comprising a metal substrate with a surface ceramic coating in which the surface ceramic coating comprises an oxidized alloy of 15% to 75% by weight copper, 25% to 85% by weight of one or both of nickel or manganese, 0% to 5% by weight of one or more of lithium, calcium, aluminum, magnesium or ion and 0% to 30% by weight of one or more of platinum, gold or palladium in which

the copper is fully oxidized and at least part of the nickel, manganese, or both is oxidized in solid solution with the copper oxide, and in which the substrate comprises 10–30% by weight of chromium and 55–90% of one or more of nickel, cobalt or iron and up to 15% by weight of one or more of aluminum, hafnium, molybdenum, niobium, silicon, tantalum, titanium, tungsten, vanadium, yttrium and zirconium, the interface of the substrate with the surface ceramic coating having an oxygen-barrier layer comprising chromium oxide.

12. A method of making the material of claim 1 comprising:

applying a copper-based alloy to the substrate alloy, and

oxidizing the material to:

(*a*) fully oxidize the copper to copper oxide;

(*a*) at least partially oxidize other metal in the surface coating to stabilize the copper oxide; and

(*c*) surface oxidize the substrate to form an oxygen-barrier interface oxide layer inhibiting further oxidation of the substrate.

4,960,495

PROCESS FOR PRECISE PROCESSING OF WORKPIECE USING FREE RADICALS

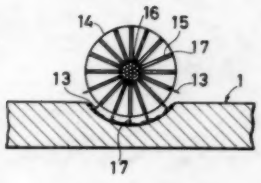
Yuzo Mori, Katano, and Kazuto Yamauchi, Suita, both of Japan, assignors to Mikakto Precision Engineering Research Institute Co., Ltd., Osaka, Japan

Filed Jun. 24, 1988, Ser. No. 211,184

Claims priority, application Japan, Jun. 26, 1987, 62-160760

Int. Cl.[5] B23H *7/02, 7/12, 7/38, 9/14*

U.S. Cl. 204—129.3 **9 Claims**



1. A stainless precision process for processing a workpiece using free radicals consisting essentially of:

disposing the workpiece to be processed a little apart from a disk wheel or a plane lap plate and in an atmosphere of a gas capable of forming free radicals reactive with atoms or molecules of the workpiece to form a volatile compound with said atoms or molecules, said disk wheel or plane lap plate containing therein an optical fiber capable of transmitting a laser beam between an incident port in said disk wheel or plane lap plate and an ejection port in said disk wheel or plane lap plate opposite the workpiece; and

rotating the disk wheel or moving the plane lap plate relative to the workpiece, while irradiating the workpiece with a laser beam transmitted by the optical fiber from said incident port to said ejection port, thereby forming free radicals and processing the workpiece.

4,960,496

ATMOSPHERIC HCl MONITOR

Steven H. Hoke, Walkersville, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Mar. 16, 1989, Ser. No. 324,525

Int. Cl.[5] G01N *27/416*

U.S. Cl. 204—153.13 **6 Claims**

1. A monitoring device for rapid monitoring of atmospheric HCl comprising:

an air inlet conduit for introducing HCl laden air into the monitoring device;

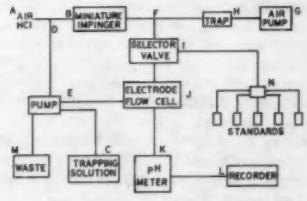
means for introducing a trapping solution into the air inlet conduit for mixing with the HCl in the HCl laden air, the means for introducing the trapping solution including a first pump for pumping the trapping solution into the air inlet conduit;

impinger means connected to the air inlet conduit and located downstream of the means for introducing trapping solution for causing the HCl in the HCl laden air to mix with the trapping solution;

separating means connected to and located downstream of the impinger means for separating air from the trapping solution, said separating means having an inlet connected to the impinger means, and first and second outlets;

air pump and liquid trap means connected to the first outlet of the separating means for drawing the air and a portion of the trapping solution from the separating means, the liquid trap means inserted between the first outlet of the separating means and the air pump, the air pump and liquid trap means operating to create a suction in the first outlet of the separating means for drawing off a portion of the trapping solution which carries off substantially all air from the separating means, so that air is removed from the remaining portion of the trapping solution flowing from the second outlet of the separating means;

an electrode flow cell connected to the second outlet of the separating means for receiving the remaining portion of the trapping solution and for determining the concentration of chloride ion in the remaining portion of the trapping solution; and



means for drawing trapping solution from the second outlet of the separating means and through the electrode flow cell.

6. A process for determining the atmospheric HCl in a sample on a continuous basis and within about three to five seconds of the taking of a sample comprising the steps of:

introducing a sample of HCl laden air into an air inlet conduit;

mixing a trapping solution with the HCl laden air for separating chloride ions from the air;

separating the air and a portion of the trapping solution from the remaining portion of the trapping solution so that the remaining portion of trapping solution is substantially free of air, wherein the air and portion of trapping solution are drawn through a fluid trap and air pump means with the portion of trapping solution being separated from the air in the flow trap means and serving to carry the air away from the remaining portion of trapping solution;

introducing the remaining portion of trapping solution into an electrode flow cell containing a measuring electrode for measuring the potential of the chloride ion in the trapping solution and a reference electrode;

measuring the potential difference between the measuring electrode and the reference electrode to determine the chloride ion concentration; and

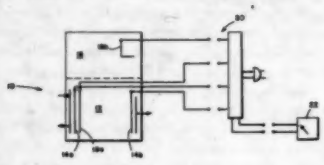
drawing the remaining portion of trapping solution through and away from the electrode flow cell, wherein the process for determining the atmospheric HCl in the sample occurs within about three to five seconds.

4,960,497

APPARATUS AND METHOD FOR MINIMIZING THE EFFECT OF AN ELECTROLYTE'S DISSOLVED OXYGEN CONTENT IN LOW RANGE OXYGEN ANALYZERS

John P. Gallagher, deceased, late of Palm Beach, Fla. (Janice M. Gallagher, legal representative), assignor to Delta F Corporation, Woburn, Mass.

Filed Sep. 20, 1989, Ser. No. 410,111
Int. Cl.[5] G01N 27/42
U.S. Cl. 204—153.16 20 Claims



1. In an electrolytic cell where an electrolytic current is generated between the sensing electrodes, and one of the electrodes is a sensing electrode specific to a component to be measured, and the electrolyte contains that component, thereby interferring with the measuring, the improvement which comprises:

a first barrier electrode interposed between the sensing electrode specific to the component to be measured and the electrolyte;

a second electrode disposed in said electrolyte; and

means to generate an electrolysis current between the first and second electrode independent of the electrolytic path between the sensing electrodes, the first barrier electrode positioned such that the unwanted components migrating to the sensor electrode are electrolytically inhibited from interferring with the sensing reaction.

12. A method for the electrolytic measurement of a component in a fluid stream which includes:

(a) providing an electrolytic cell having a pair of sensor electrodes, one electrode specific for a component to be analyzed in a fluid stream, the sensor electrodes completing a first electrolytic path;

(b) providing a first barrier electrode and a second electrode, the barrier electrode interposed between the sensing electrode specific for the component to be analyzed and the electrolyte, the first and second electrodes defining a second electrolytic path, the function of which is independent of the function of the first electrolytic path; and

(c) applying a voltage across the first and second electrodes to activate the barrier electrode such that unwanted components in the electrolyte are electrolytically inhibited from flowing to the sensing cathode.

4,960,498

METHOD OF MANUFACTURING A MAGNETIC HEAD

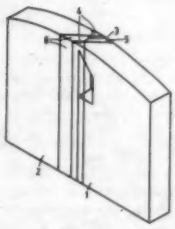
Horst Gukkenberger, Zirndorf, and Karl Eberle, Cadolzburg, both of Fed. Rep. of Germany, assignors to Grundig E.M.V. Elektromechanische Versuchsanstalt, Fürth/Bayern, Fed. Rep. of Germany

Filed Aug. 24, 1987, Ser. No. 88,765
Claims priority, application Fed. Rep. of Germany, Aug. 26, 1986, 3628950
Int. Cl.[5] C23C 14/34
U.S. Cl. 204—192.2 3 Claims

1. A method of manufacturing a magnetic head having a sputtered gap region, in which the magnetic core comprises two soft magnetic core halves with a non-magnetic gap therebetween, a glass inclusion on either side of said gap, and an abrasion resistant soft magnetic layer between the gap and the core halves, said method comprising the following steps:

providing two alloy targets having a weak magnetic property in a magnetron sputtering apparatus,

sputtering said soft magnetic layer on said core halves at sputtering rates suitable to yield a desired alloy having an



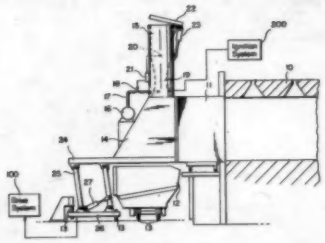
increased magnetic property, one sputtering rate being used for each target.

4,960,499

COKE OVEN HOOD APPARATUS

Richard Jablin, 2500 W. Club Blvd., Durham, N.C. 27705

Filed Aug. 1, 1989, Ser. No. 388,054
Int. Cl.[5] C10B 27/00, 33/14
U.S. Cl. 202—263 11 Claims



1. A pollution control system for coke ovens, comprising

(a) a hood for capturing gaseous and particulate emissions arising during coke pushing into a quench car, said hook having side walls and being open at its upper and lower end;

(b) a vertically oriented combustion stack having a lower portion connected with the upper end of said hood for incinerating said emissions and for producing a draft which draws said emissions into said hood;

(c) a combustion system connected with said stack, including

(1) a fuel storage tank;

(2) fuel admission means connected with said lower portion of said stack;

(3) automatic ignition means for igniting the fuel admitted to said stack; and

(4) temperature control means for regulating the quantity of fuel admitted to said stack in order to maintain a desired temperature therein;

(d) an adjustable damper arranged in said stack for regulating the amount of air drawn into the open lower end of said hood by the natural draft produced in said stack; and

(e) a movable hood car resting on railroad tracks extending parallel to a battery of coke ovens for supporting said hood, whereby said hood may be displaced along said battery of ovens to capture and ignite the emissions therefrom.

4,960,500

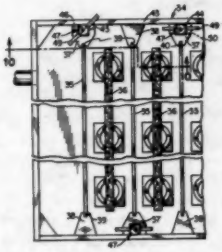
WASTE METAL EXTRACTION APPARATUS

Randolph L. Epner, 393 Valley Rd., Haworth, N.J. 07641

Continuation-in-part of Ser. No. 230,596, Aug. 10, 1988, Pat. No. 4,863,580. This application Aug. 2, 1989, Ser. No. 389,048

Int. Cl.[5] C25C *7/00, 7/06*

U.S. Cl. 204—269 **9 Claims**



1. A waste metal extraction apparatus including a cell tank having a bottom, at least two sidewalls, an inlet wall and an outlet wall, a plurality of alternating cathodes and anodes locatable therein for electrolytically removing a metal from a waste stream passing therethrough, the apparatus further comprising:

a plurality of baffles disposed on the tank sidewalls, the baffles on one sidewall oppositely disposed from the baffles on the other sidewall, at least half the baffles being flow control baffles, each flow control baffle having upstreat inlet passages and downstream outlet passages and having means for adjusting the flow of the waste stream passing through the baffle, the flow control baffles being disposed opposite and adjacent baffles through which no flow is allowed, such that the waste stream passing through the flow control baffles is guided through the tank in an essentially serpentine flow path.

4,960,501

ELECTROLYTIC CELL FOR THE PRODUCTION OF A METAL

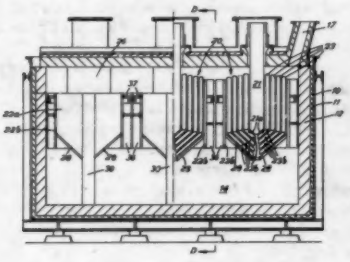
Olivo G. Sivilotti, Kingston, Canada, assignor to Alcan International Limited, Canada

Filed Mar. 12, 1989, Ser. No. 296,066

Claims priority, application United Kingdom, Jan. 13, 1988, 8800674

Int. Cl.[5] C25C *7/00*

U.S. Cl. 204—244 **10 Claims**



1. An electrolytic cell for the production of a metal by electrolysis of a molten electrolyte which is more dense than the metal, comprising

an electrolysis chamber,

a metal collection chamber,

means for conducting product metal and electrolyte from an upper region of the electrolysis chamber to the metal collection chamber,

means for conducting electrolyte from the metal connection chamber to a lower region of the electrolysis chamber,

at least one electrode assembly including a cathode assembly defining within it a vertical cavity,

an anode disposed within said cavity,

at least one intermediate bipolar electrode assembly disposed between the anode and the cathode assembly, and baffle means for preventing or impeding flow of the electrolyte between the cathode assembly and a wall of the electrolysis chamber and/or between the cathode assembly and an adjacent cathode assembly said baffle means comprising at least one horizontal baffle having one lengthwise edge thereof secured to an outer face of the cathode assembly and having an opposite lengthwise edge thereof embedded in said wall of the electrolysis chamber.

4,960,502

PROCESS FOR CONVERSION OF OILS TO HYDROCARBON PRODUCTS

Floyd H. Holland, Borger, Tex., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 6,084, Jan. 23, 1987, Pat. No. 4,853,189. This application May 22, 1989, Ser. No. 354,721

Int. Cl.[5] C10G *55/06*

U.S. Cl. 208—85 **10 Claims**

6. In a process for catalytic cracking therein an oil feedstock containing liquid and vapor phases is contacted with a cracking catalyst to form hydrocarbon vapor products in a fluid catalytic cracking unit, the improvement comprising:

separating said oil feedstock into a vapor component and a liquid component;

atomizing said separated liquid component by contacting said liquid component with a carrier gas;

introducing said atomized liquid component and carrier gas into said cracking unit; and

separately introducing said separated vapor component into said cracking unit.

4,960,503

HEATING FCC FEED IN A BACKMIX COOLER

Edward C. Haun, Gendale Heights; Steven S. Milner, and David A. Lomas, both of Arlington Heights, all of Ill., assignors to UOP, Des Plaines, Ill.

Filed Nov. 21, 1988, Ser. No. 274,259

Int. Cl.[5] C10G *55/06, 11/18*

U.S. Cl. 208—85 **5 Claims**

1. A process for the fluidized catalytic cracking (FCC) of an FCC feedstock said process comprising:

(a) contacting a heated FCC feedstock and hot FCC catalyst in a reactor riser to at least partially convert said heated FCC feedstock to a product stream comprising lower boiling hydrocarbons and produce a spent FCC catalyst containing coke deposits thereon;

(b) separating said product stream from said spent FCC catalyst, recovering said product stream and transferring said spent catalyst particles to a regeneration zone;

(c) combusting coke from said spent catalyst particles in said regeneration zone and producing hot FCC catalyst;

(d) circulating catalyst particles between said regeneration zone and an upper portion of a remote catalyst cooler, said cooler having a lower section closed to external catalyst circulation and a plurality of heat exchange tubes located in said lower section;

(e) passing a heatable FCC feedstock through the tube side of said cooler in liquid phase at a velocity of at least 7 ft/sec to raise the temperature of said heatable FCC feedstock to a temperature of from 500°–700° F. and produce said heated FCC feedstock;

(f) controlling the temperature of the surfaces of said tubes in contact with said feedstock by passing fluidizing gas through the shell side of said cooler at a superficial velocity of from 0.1 to 2.5 ft/sec. forming a dense phase catalyst bed in said cooler and circulating catalyst from said upper portion around said tubes;

(g) passing fluidizing gas from said upper portion of said cooler to said regeneration zone;

(h) transferring hot FCC catalyst from said regeneration zone to said riser; and

(i) passing said heated FCC feedstock from said cooler to said riser.

4,960,504

DEWAXING CATALYSTS AND PROCESSES EMPLOYING SILICOALUMINOPHOSPHATE MOLECULAR SIEVES

Regis J. Pellet, Croton-On-Hudson; Jule A. Rabo, Armonk; Gary N. Long, Putnam Valley; Frank P. Gortsema, Pleasantville, and Albert R. Springer, Yonkers, all of N.Y., assignors to UOP, Des Plaines, Ill.

Continuation-in-part of Ser. No. 683,246, Dec. 18, 1984. This application Feb. 22, 1988, Ser. No. 158,667

The portion of the term of this patent subsequent to Mar. 6, 2007, has been disclaimed.

Int. Cl.[5] C10G *47/04, 47/16*

U.S. Cl. 208—411 **42 Claims**

1. An improved process for catalytically dewaxing a hydrocarbon feedstock boiling above 350° F. and containing high pour point paraffinic waxes and hydrocarbons, comprising selective conversion of said paraffinic waxes and hydrocarbons, said process comprising contacting the hydrocarbon feedstock at effective dewaxing conditions with a dewaxing catalyst comprising an amount of at least one silicoaluminophospate (SAPO) effective in reducing the pour point of said hydrocarbon feedstock, wherein said SAPO is characterized in its calcined form by an adsorption of isobutane of at least 2 percent by weight at a pressure of 500 torr and a temperature of 20 C, said catalyst further comprising an inorganic oxide matrix component present in an amount between about 0 and about 99 percent by weight, based on the total weight of said catalyst, so as to produce products having a reduced pour point relative to the hydrocarbon feedstock.

4,960,505

PROCESS FOR THE HYDROGENATION OF HYDROCARBON OILS

Johannes K. Minderhoud, Amsterdam, Netherlands, and Jacques Lucien, Grand-Couronne, France, assignors to Shell Oil Company, Houston, Tex.

Filed Aug. 12, 1988, Ser. No. 231,282

Claims priority, application France, Aug. 14, 1987, 8711591

Int. Cl.[5] C10G *47/20*

U.S. Cl. 208—143 **24 Claims**

1. A process for the hydrogenation of hydrocarbon oils by contacting at a temperature between 150° and 350° C. a hydrocarbon oil feedstock containing hydrogenatable components and having a boiling range between 130° C. and 520° C. with hydrogen under conditions wherein at least 70% of the total hydrogenatable components is hydrogenated using a catalyst comprising one or more Group VIII noble metal(s) on a support wherein the support comprises a Y zeolite having a unit cell size between 24.20 and 24.30 Å and a SiO_2/Al_2O_3 molar ratio above 35 and recovering a product containing at least 50% by weight of the material present in the feedstock between the 90% w boiling point and the final boiling point of the feedstock.

4,960,506

DESULFURIZATION OF HYDROCARBONS USING MOLYBDENUM OR TUNGSTEN SULFIDE CATALYSTS PROMOTED WITH LOW VALENT GROUP VIII METALS

Thomas R. Halbert, Annandale; Edward I. Stiefel, Bridgewater; Russell R. Chianelli, Somerville, and Teh C. Ho, Bridgewater, all of N.J., assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Division of Ser. No. 725,662, Apr. 22, 1985, Pat. No. 4,839,326. This application Mar. 20, 1989, Ser. No. 325,727

Int. Cl.[5] C10G *45/08*

U.S. Cl. 208—215 **12 Claims**

1. A process for substantially selectively hydrodesulfurizing a hydrocarbon containing at least some sulfur and nitrogen containing compounds comprising the steps of:

contacting the hydrocarbon, in the presence of at least an effective amount of hydrogen with a predecessor catalyst comprising molybdenum or tungsten sulfide which has been promoted by reaction with a transition metal containing organo-metallic complex wherein the valence of the metal is 0 or +1 at said reacting, and said contacting being done at a temperature and pressure sufficient to substantially selectively hydrodesulfurize the hydrocarbon.

4,960,507

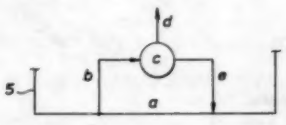
TWO-STEP HETEROCYCLIC NITROGEN EXTRACTION FROM PETROLEUM OILS

Wayne E. Evans, Richmond, and George C. Blytas, Houston, both of Tex., assignors to Shell Oil Company, Houston, Tex.

Continuation-in-part of Ser. No. 325,707, Mar. 20, 1989, abandoned. This application Oct. 6, 1989, Ser. No. 418,070

Int. Cl.[5] C10G *17/04*

U.S. Cl. 208—254 R **29 Claims**



1. A process for the removal of basic heterocyclic nitrogen compounds from petroleum oils which comprises:

(a) contacting said petroleum oils containing basic heterocyclic nitrogen compounds with an aqueous solution of an acidic solvent at extraction conditions in a first contacting zone,

(b) separating the product of step (a) into a raffinate product stream comprising hydrocarbons having a lean content of basic heterocyclic nitrogen compounds and residual acid levels, and a first extract phase comprising hydrocarbons, water and acid having a substantial content of basic heterocyclic nitrogen compounds,

(c) contacting said first extract phase with a hydrocarbon solvent that is substantially immiscible with said first extract phase at extraction conditions in a second contacting zone, and

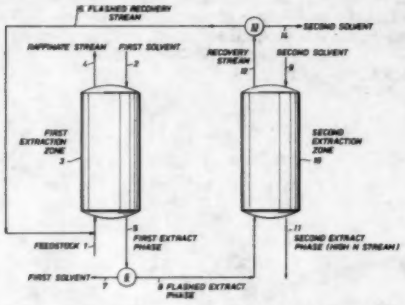
(d) separating the product of step (c) into a hydrocarbon recovery stream comprising the immiscible hydrocarbon solvent and oil-derived hydrocarbons having a lean content of basic heterocyclic nitrogen compounds and a second extract phase comprising acid, water, a high content of basic heterocyclic compounds and a decreased amount of nitrogen-free hydrocarbons.

4,960,508

TWO-STEP HETEROCYCLIC NITROGEN EXTRACTION FROM PETROLEUM OILS

Wayne E. Evans, Richmond, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Jan. 30, 1989, Ser. No. 303,334
Int. Cl.[5] C10G 17/04
U.S. Cl. 208—254 R 28 Claims



1. A process for the removal of basic heterocyclic nitrogen compounds from petroleum oils which comprises:

(a) contacting said petroleum oils containing basic heterocyclic nitrogen compounds with an aqueous solution of a first solvent comprising concentrated acid at extraction conditions in a first extraction zone,

(b) separating the product of step (a) into a raffinate product stream comprising hydrocarbons having a lean content of basic heterocyclic nitrogen compounds and residual acid levels, and a first extract phase comprising hydrocarbons, water and acid having a substantial content of basic heterocyclic nitrogen compounds,

(c) flashing said first extract phase to remove bulk first solvent,

(d) contacting said flashed first extract stream with an aqueous solution of a second solvent comprising a dilute acid at extraction conditions in a second extraction zone, and

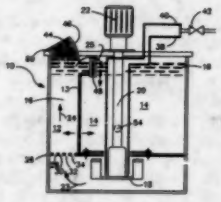
(e) separating the product of step d) into a recovery stream comprising hydrocarbons having a lean content of basic heterocyclic nitrogen compounds and a second extract phase comprising acid, water and a decreased amount of hydrocarbons, and having a high content of basic heterocyclic nitrogen compounds.

4,960,509

ORE FLOTATION DEVICE AND PROCESS

Harry L. McNeill, Tempe, Ariz., assignor to Colorado School of Mines, Golden, Colo.

Filed Jul. 17, 1989, Ser. No. 380,984
Int. Cl.[5] B03D 1/16, 1/22
U.S. Cl. 209—164 14 Claims



1. A flotation device comprising

(a) a flotation vessel;

(b) a flotation zone of substantially uniform cross-sectional area located within said flotation vessel, wherein the perimeter of said flotation zone is defined by walls and the upper and lower ends of said flotation zone are at least partially open to permit flow therethrough;

(c) a feed zone located within said flotation vessel adjacent said flotation zone and separated therefrom by a vertical baffle, said baffle being part of the walls that define said flotation zone, said baffle extending from the lower end of the flotation zone to the upper end of the flotation zone thereby defining the upper and lower ends of said flotation zone, the lower end of said baffle being spaced from the bottom of the vessel thereby defining a lower passage through which pulp can flow into said flotation zone, the upper end of said baffle being located below the upper edge of the vessel walls thereby defining an upper passage for pulp to flow over the top of the baffle and into said feed zone;

(d) an agitation reducing plate having holes therein and located at or near the lower end of said baffle;

(e) means located within said flotation vessel for circulating pulp through said flotation vessel, wherein said pulp flows substantially from said circulating means through said lower passage and upward through said agitation reducing plate into said flotation zone and continues to flow in an upward direction from the lower end of said flotation zone to the upper end of said flotation zone;

(f) means for introducing gas bubbles into said flotation vessel, wherein said gas bubbles travel through said lower passage and upwardly from the lower end to the upper end of said flotation zone and desired particles become attached to the gas bubbles in said flotation zone; and

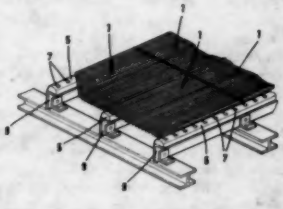
(g) means for discharging froth located directly above the upper end of said flotation zone.

4,960,510

SCREENING APPARATUS HAVING A SCREEN GRID WITH A PLURALITY OF EXCHANGEABLE SCREEN ELEMENTS

Kurt Wolff, Dinslaken, Fed. Rep. of Germany, assignor to Steinhaus GmbH, Mulheim, Fed. Rep. of Germany

Filed Jun. 13, 1988, Ser. No. 205,885
Claims priority, application Fed. Rep. of Germany, Jun. 26, 1987, 3721108; Sep. 23, 1987, 8712824
Int. Cl.[5] B07B 1/46
U.S. Cl. 209—405 22 Claims



1. A screening apparatus with a screen grid comprising:

a plurality of exchangeable screen elements placed adjacent each other to form said screen grid, each of said screen elements having longitudinal edges and a screen surface with screen openings therein, said screen surface having a top side and a bottom side;

adjacent screen elements of said screen grid being placed along at least their longitudinal edges on intermediate cross-pieces, said intermediate cross-pieces being attached to a carrier-framework;

said adjacent screen elements being placed in direct contact

and flushed with each other in an end to end orientation to form a continuous screen surface of said screen grid; and plurality of separators for supporting said screen elements thereon and for removably mounting said screen elements on said intermediate cross-pieces, said separators being positioned transversely with respect to said intermediate cross-pieces;

wherein said separators are protruding at such a distance from underneath said bottom side of said screen surface of a corresponding screen element to said intermediate cross-pieces that a passage space for passing the material being screened, is formed below said screen surface and between said separators, in an area of connection of said adjacent screen elements through said separator onto said intermediate cross-pieces.

4,960,511

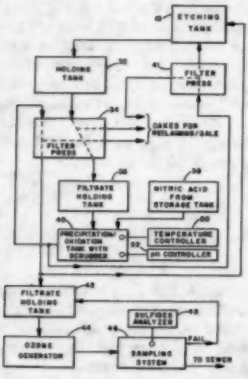
APPARATUS FOR DEPLETED CHEMICAL MILLING SOLUTIONS

Florimel Doble, Spring Valley; Jose M. Gallego, National City; El Steidl, Lakeside, and Cyrus Jaffari, Alpine, all of Calif., assignors to Caspian International, Inc., San Diego, Calif.

Division of Ser. No. 926,188, Nov. 3, 1986, Pat. No. 4,826,605. This application Sep. 19, 1988, Ser. No. 245,809

Int. Cl.[5] B01D *36/04*

U.S. Cl. 210—96.1 **4 Claims**



1. An apparatus for removing undesirable chemicals from a chemical etch solution comprising a receptacle for receiving etch solution; and

agitation means for agitating said etch solution in said receptacle to prevent the formation of chemical deposits;

a filter means for filtering said etch solution at a temperature of ambient - 120° F., thereby forming a first filtrate substantially free of said chemicals;

a second receptacle for receiving said first filtrate and a third receptacle for receiving said first filtrate from said second receptacle and for receiving acid to coact with said first filtrate thereby precipitating and/or oxidizing residual chemicals present in said first filtrate;

an agitation means present in said third receptacle to prevent the formation of precipitates in said third receptacle;

a fourth receptacle for receiving said first filtrate after an additional passage through said filter device to remove said residual chemicals;

and ozone generator for providing ozone to said second filtrate contained in said fourth receptacle;

a sampling means for sampling said second filtrate after ozone reaction, and a sulfide analyzer to analyze said sample present in said sampling means to determine the level of sulfides remaining in said second filtrate;

a selection means for passing said filtrate back to said fourth receptacle, or to the sewer depending on the level of sulfides present in said second filtrate.

4,960,512

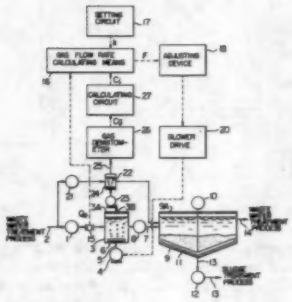
APPARATUS FOR SLUDGE THICKENING

Kenji Baba; Shoji Watanabe; Hayao Yahagi, and Hitoshi Ogasawara, all of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 598,463, Apr. 9, 1984, abandoned, which is a continuation of Ser. No. 327,117, Dec. 3, 1981, abandoned. This application Oct. 21, 1988, Ser. No. 262,214

Int. Cl.[5] C02F *11/12*

U.S. Cl. 210—96.1 **13 Claims**



1. An apparatus for sludge thickening, the apparatus comprising:

a gravity settling type sludge thickener means for allowing suspended solids of sludge discharged from an activated sludge process and supplied thereto settle by their own weight while being thickened;

a sludge aerator means for subjecting the sludge to aeration, operatively configured such that a retention time in the sludge aerator means is sufficient for stripping the gas bubbles on one of a surface and inside of the sludge particles and dissolved gas in the mixed liquor which contains sludge particles to the atmosphere without biologically destroying the organic materials in the sludge;

means for introducing aeration gas to the sludge aerator means;

means for supplying the sludge from the sludge aerator means to the gravity settling type sludge thickener means;

sensing means for sensing a rate of gas produced by anaerobic bacterial in the sludge introduced to said sludge aerator means; and

means for controlling the flow rate of the aeration gas introduced into said aerator means in accordance with the produced gas rate sensed by said sensing means so as to increase the aeration gas flow rate upon the increase in a volume of the produced gas flow.

4,960,513

SEPARATOR FOR LIQUIDS OF DIFFERENT DENSITIES

James T. Young, 1728 Caron La., Douglasville, Ga. 30134

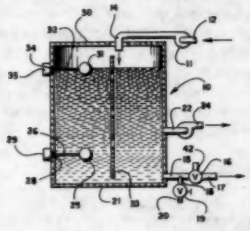
Filed Aug. 21, 1989, Ser. No. 396,122

Int. Cl.[5] C02F *1/40*

U.S. Cl. 210—104 **2 Claims**

1. A separator for the automatic continuous separation of liquids having different densities, said separator including a separation tank having a top and a bottom, a source of mixed liquids, means for transferring mixed liquids from said source of mixed liquids to said separation tank, density indicating means adjacent to said bottom of said separation tank, liquid level indicating means adjacent to said top of said separating tank, a first discharge means at said bottom of said separating

tank for selectively discharging a high density fraction of said mixed liquid, and a second discharge means above said first discharge means for selectively discharging a low density fraction of said mixed liquid, said density indicating means including means for selectively activating said first discharge means and said second discharge means, said density indicating means including a float, and a first switch actuated by said float, an electrically operated valve for allowing discharge through said first discharge means, and first circuit means connecting said first switch to control said electrically operated valve, said second discharge means including a pump, and second circuit means connecting said first switch to control operation of said pump, said liquid level indicating means including a second float, and a second switch operated by said



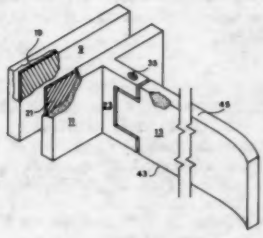
second float, said means for transferring mixed liquids from said source of mixed liquids to said separation tank including a second pump, and third circuit means connecting said second switch to cause operation of said second pump, said first switch having a first contact that is closed when said float sinks low in said separation tank, said first contact being electrically connected to said second circuit means for causing operation of said pump for discharging a low density fraction of said mixed liquid, a second contact that is closed when said float rises high in said separation tank, said second contact being electrically connected to said first circuit means for causing operation of said valve for discharging a high density fraction of said mixed liquid, and a third contact that is closed when said float is in its mid position, and fourth circuit means connected to said third contact for preventing operation of said valve.

4,960,514

SKIMMING APPARATUS FOR A SWIMMING POOL

John E. Paskert, 2582-F Arlington Mill Dr., Arlington, Va. 22206

Filed Dec. 22, 1989, Ser. No. 454,964
Int. Cl.[5] E04H *4/14*
U.S. Cl. 210—169 **18 Claims**



1. Skimming apparatus for a swimming pool for maximally deflecting and guiding surface-water-borne dirt, leaves, pollen and other debris in a swimming pool toward and into an inlet opening of a swimming pool skimmer mounted in a wall of the swimming pool, and for causing dirt, leaves, pollen and other debris, submerged in the swimming pool, and, hence, to become surface-water-borne, and to be likewise deflected and guided into the swimming pool skimmer's inlet opening, including

base member means,

means fixedly mounting said base member means on the swimming pool wall in proximity to the swimming pool skimmer's inlet opening,

bracket means for carrying elongated deflector means,

said base member means and said bracket means having means both for adjustable disposition of said base member means and said bracket means for infinitely adjustable and translatory positioning of said bracket means and said deflector means vertically, laterally and radially relative to said base member means for operatively disposed said deflector means in immediate proximity to the swimming pool skimmer's inlet opening, for operatively disposing said deflector means in partial to full submersion relative to the surface water in the swimming pool to compensate for the water level of the surface water, and for operatively disposing said deflector means to cause submerged dirt, leaves, pollen and other debris to rise to the surface of the water in the swimming pool to become surface-water-borne and to be deflected and guided into the swimming pool skimmer's inlet opening, and for detachable mounting of said base member means and said bracket means, and

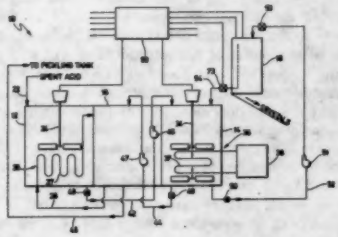
said bracket means and said deflector means having their own means for adjustable disposition of said deflector means in lateral and angular relationship relative to said bracket means for maximally deflecting and guiding surface-water-borne dirt, leaves, pollen and other debris toward and into the swimming pool skimmer's inlet opening.

4,960,515

LIQUID RECOVERY SYSTEM

Richard D. Billmyre, 4822 Fauna La., Indianapolis, Ind. 46234

Division of Ser. No. 315,809, Feb. 27, 1989, Pat. No. 4,894,170.
This application Oct. 17, 1989, Ser. No. 422,533
Int. Cl.[5] C02F *1/52*
U.S. Cl. 210—195.1 **5 Claims**



1. An acid recovery system comprising: means for precipitating dissolved solid material from a spent acid and for separating the precipitated solid material from the spent acid to provide a recovered acid including

a tank containing a supply of spent acid;

temperature reducing means for reducing the temperature of the spent acid in said tank to a temperature at which said dissolved solid material is substantially fully precipitated out of said acid;

a separator;

circulating means for circulating spent acid from said tank through said separator for separating the precipitated solid material from said spent acid by gravity to provide recovered acid in said tank and accumulated solid material in said separator; and

means for dispensing said accumulated solid material from said separator by gravity.

4,960,516

LIQUID MICROCOLUMN CHROMATOGRAPH

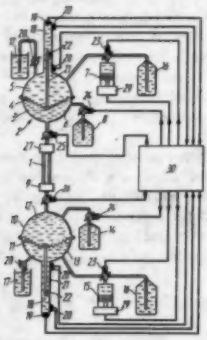
Maxim L. Alexandrov, prospekt Engelsa, 63, korpus 3, kv. 89; Boris G. Belenky, Litelny prospekt, 46, kv. 10; Vladimir A. Gotlib, Vasilievsky ostrov, 4 linia, 1/3, kv. 65; Arkady P. Vlasov, ulitsa Beringa, 32 korpus 1, kv. 11; Nikolai N. Komarov, ulitsa Trefoleva, 6/30, kv. 64; Valery V. Sudilin, Lakhtinskaya ulitsa, 20, kv. 14, and Vsevolod V. Shevkunov, ulitsa Stakhanovtsev, 12, kv. 34, all of Leningrad, U.S.S.R.

PCT No. PCT/SU87/00068, § 371 Date Jan. 23, 1989, § 102(e) Date Jan. 23, 1989, PCT Pub. No. WO88/10425, PCT Pub. Date Dec. 29, 1988

PCT Filed Jun. 16, 1987, Ser. No. 328,034

Int. Cl.[5] B01D *15/08*

U.S. Cl. 210—198.2 4 Claims



1. A liquid microcolumn chromatograph comprising a microcolumn (1), a unit (2) for feeding eluent, said unit being made as a main reservoir (3) separated by a "slack" diaphragm (4) into two half-chambers (5, 6) of which one communicates with a main source (7) of pressure and is filled with a working agent, while the other is connected to a source (8) of eluent and to an inlet to the microcolumn (1), a flow-through cell (9) of a detector at the outlet of the microcolumn (1), and an eluent-collecting vessel (14), characterized in that it is provided with an additional vessel (10) whose volume is essentially greater than that of the eluent required for carrying out a single analysis, separated by a "slack" diaphragm (11) into two half-chambers (12, 13), and with an additional source (15) of pressure, the half-chamber (12) communicating with the outlet of the flow-through cell (9) of the detector and with the eluent-collecting vessel (14), whereas the half-chamber (13) is communicated with an additional source (15) of pressure.

4,960,517

TREATMENT OF COMPOSITE POLYAMIDE MEMBRANES VIA SUBSTITUTION WITH AMINE REACTIVE REAGENTS

John E. Cadotte, Minnetonka, Minn., assignor to Filmtec Corporation, Minneapolis, Minn.

Filed Dec. 13, 1989, Ser. No. 450,705

Int. Cl.[5] B01D *61/02*

U.S. Cl. 210—639 22 Claims

1. A method of treating a composite crosslinked polyamide reverse osmosis membrane comprising: enabling the passage through the membrane of H_2SO_4 in a 2 percent aqueous solution at 400 psig and 15° to 35° C. to be reduced by at least about 30 percent relative to the membrane to be reduced by not more than about 5 percent after treatment, by, contacting a composite membrane having a crosslinked polyamide discriminating layer with a solution of an effective amount of an amine-reactive reagent selected from the group consisting of an organic halogen compound which reacts with a primary or secondary amine via an alkylation reaction, a carboxylic acid anhydride, a carboxylic acid ester, a 1,3-heterocyclic sultone having 3 carbon atoms in the ring, and an amine-reactive ethylenically-unsaturated compound.

15. A treated composite crosslinked polyamide membrane prepared by a process comprising providing properties which enable the membrane after treatment to have a water flux of at least 50 percent of the membrane prior to treatment and to enable passage of H_2SO_4 in a 2 percent aqueous solution at 400 psig and 25° C. to be refused by at least 30 percent relative to the membrane prior to treatment, by, contacting a crosslinked polyamide discriminating layer of a reverse osmosis composite membrane with a solution of an effective amount of an amine-reactive reagent selected from the group consisting of an organic halogen compound which reacts with a primary or secondary amine via an alkylation reaction, a carboxylic acid anhydride, a carboxylic acid ester, a 1,3-heterocyclic sultone having 3 carbon atoms in the ring, and an ethylenically-unsaturated hydrocarbon.

4,960,518

TREATMENT OF COMPOSITE POLYAMIDE MEMBRANES WITH COMPATIBLE OXIDANTS

John E. Cadotte, Minnetonka, and Joel R. Racchini, St. Louis Park, both of Minn., assignors to The FilmTec Corporation, Minneapolis, Minn.

Filed Dec. 13, 1989, Ser. No. 450,691

Int. Cl.[5] B01D *61/02*

U.S. Cl. 210—639 22 Claims

1. A method of treating a composite crosslinked polyamide reverse osmosis membrane comprising: contacting a composite membrane having a crosslinked polyamide discriminating layer with a solution of an effective amount of a compatible oxidizing reagent, in quality and/or quantity sufficient for providing the membrane with properties for enabling the passage through the membrane of H_2SO_4 in a 2 percent aqueous solution at 400 psig and 15° to 35° C. to be reduced by at least 30 percent relative to the membrane prior to treatment and the water flux of said membrane to be reduced by not more than 50 percent after treatment.

14. A treated composite crosslinked polyamide membrane prepared by a process comprising contacting a crosslinked polyamide discriminating layer of a reverse osmosis composite membrane with a solution of an effective amount of a compatible oxidizing reagent in quality and/or quantity sufficient for providing the membrane with properties for enabling the membrane after treatment to have a water flux of at least 50 percent of the membrane prior to treatment and to enable passage of H_2SO_4 in a 2 percent aqueous solution at 400 psig and 25° C. to be reduced by at least 30 percent relative to the membrane prior to treatment.

4,960,519

MEMBRANE PROCESS FOR SEPARATION OF ORGANIC LIQUIDS

Mordechai Pasternak, Spring Valley; Craig R. Bartels, Wappingers Falls; John Reale, Jr., Wappingers Falls, and Vatsal M. Shah, Wappingers Falls, all of N.Y., assignors to Texaco Inc., White Plains, N.Y.

Filed Oct. 16, 1989, Ser. No. 421,878

Int. Cl.[5] B01D *61/36*

U.S. Cl. 210—640 6 Claims

6. The method comprising: treating a charge composition containing (i) methanol and (ii) methyl t-butyl ether by a pervaporation process including,

maintaining a non-porous membrane separating layer of a blend of a polyvinyl alcohol and a polyacrylic acid on a polyacrylonitrile support layer;

maintaining a pressure drop across said non-porous separating layer;

passing a charge composition containing methanol and methyl t-butyl ether into contact with the high pressure side of said non-porous separating layer whereby at least a portion of said methanol in said charge composition and a lesser portion of methyl t-butyl ether pass by pervaporation through said non-porous separating layer as a lean mixture containing more methanol and less methyl t-butyl ehter than are present in said charge composition and said charge composition is converted to a rich liquid containing less methanol and more methyl t-butyl ether than are present in said charge composition;

recovering as permeate from the low pressure side of said non-porous separating layer said lean mixture containing more methanol and less methyl t-butyl ether than are present in said charge composition, said lean mixture being recovered in vapor phase at a pressure below the vapor pressure thereof; and

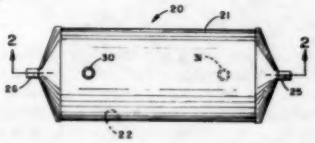
recovering as retentate from the high pressure side of said non-porous separating layer said rich liquid containing a lower methanol content and a higher methyl t-butyl ether content than are present in said charge composition.

4,960,520

METHOD OF REMOVING ORGANIC VOLATILE AND SEMI-VOLATILE CONTAMINANTS FROM AN AQUEOUS SOLUTION

Michael J. Semmens, Minneapolis, Minn., assignor to The Regents of the University of Minnesota, Minneapolis, Minn.

Filed Jul. 14, 1989, Ser. No. 380,003
Int. Cl.[5] F01D *61/36*
U.S. Cl. 210—640 **20 Claims**



1. A method of transferring an evaporable contaminant from an aqueous solution to a nonaqueous stripping solvent comprising the step of transporting the contaminant from the aqueous solution in a gas and/or vapor phase to the stripping solvent through a gas phase membrane sufficient for contaminant to be transferred without substantial direct contact between the solvents.

9. A method of transferring an evaporable contaminant from an aqueous solution to a nonaqueous stripping solvent, comprising the steps of:

(a) obtaining a structural membrane capable of supporting a gas phase membrane between the contaminated aqueous solution and the nonaqueous stripping solvent, and

(b) diffusing the evaporable contaminant from the contaminated solution in a gas and/or vapor phase to the stripping solvent through the gas phase membrane without substantial direct contact between the contaminated solution and the stripping solvent.

4,960,521

PROCESS FOR PERFORMING A DIALYSIS OPERATION USING A MAGNETIC WEIGHTED CLAMP

Andreas Keller, 1091 Lakeview Ter., Azusa, Calif. 91702

Filed Jun. 16, 1989, Ser. No. 367,338
Int. Cl.[5] B01D *61/24, 61/28, 61/30*
U.S. Cl. 210—644 **5 Claims**

1. An improved process for performing a dialysis operation of the type including the steps of:

closing one end of a dialysis sack, said dialysis sack being of the type having one end remaining open after said closing step;

filling the dialysis sack with a liquid to be treated;

snapping a weighted clamp over said one end remaining open and placing said filled dialysis sack into a container of dialysis buffer solution, said weighted clamp being of sufficient density to cause the weighted clamp to rest on the bottom of said container of dialysis buffer solution, wherein the improvement comprises:

using a weighted clamp which includes a ferromagnetic bar; and

placing said container of dialysis buffer solution on a magnetic stir plate including a stir bar whereby when said magnetic stir bar in said stir plate is rotated, the dialysis sack is turned within the dialysis buffer solution and the buffer at the surface of the dialysis sack is repeatedly renewed.

4,960,522

COPOLYMERS OF AN ACRYLIC ACID AND ALKOXYALKYL ACRYLATE AS SCALE INHIBITORS

Zahid Amjad, Avon Lake, and William F. Masler, Hinckley, both of Ohio, assignors to The B. F. Goodrich Company, Akron, Ohio

Continuation-in-part of Ser. No. 929,970, Nov. 16, 1986, abandoned. This application Aug. 30, 1989, Ser. No. 400,436
Int. Cl.[5] C02F *5/10*
U.S. Cl. 210—701 **4 Claims**

1. A method for inhibiting formation and deposition of scale-imparting precipitates, including calcium phosphates, in an aqueous medium containing scale-imparting precipitates under deposit-forming conditions comprising the step of adding to said aqueous medium at least an effective threshold inhibition amount to obtain threshold inhibition of calcium phosphate of at least 75% of a copolymer selected from the group consisting essentially of the following copolymers (a), (b), (c), and mixtures thereof:

(a) 80:20 AA:MeOEA

(b) 60:20:20 AA:MAA:CA

(c) 60:20:20 AA:MAA:MeOEA

wherein relative amounts of the moieties of the comonomers in the copolymers are given in weight parts, and wherein

AA represents acrylic acid

MAA represents methacrylic acid

CA represents 2-(2-ethoxyethoxy) ethyl acrylate

MeOEA represents methoxyethyl acrylate.

4,960,523

PROCESS FOR WORKING UP HYDROLYSIS RESIDUES FROM THE SYNTHESIS OF ORGANOCHLOROSILANES

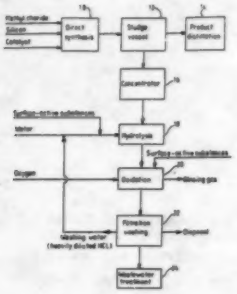
Bruno Degen, Much, and Kurt Feldner, Leverkusen, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Aug. 16, 1989, Ser. No. 394,608

Claims priority, application Fed. Rep. of Germany, Sep. 1, 1988, 3829582

Int. Cl.[5] C02F *1/72*

U.S. Cl. 210—721 **6 Claims**



1. A process for the hydrolysis and oxidation of high-boiling, solids-containing residues obtained in the synthesis of organochlorosilanes which are hydrolyzed and then oxidized with a gas comprising oxygen, comprising adding during hydrolysis and/or oxidation a surface-active agent which hydrophilicizes the surface of the solids.

4,960,524

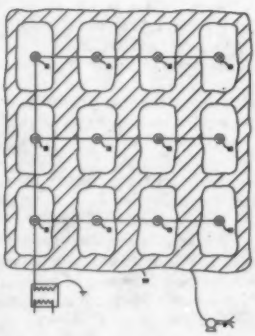
METHOD FOR SOIL CONSOLIDATION

Ion I. Inculet, 81 Lloyd Manor Crescent, London, Ontario, Canada (N6H 3Z4), and Kwan Y. Lo, 482 Village Green Avenue, London, Ontario, Canada (N6J 1Z3)

Filed Apr. 18, 1988, Ser. No. 182,660

Int. Cl.[5] C02F *1/46*; C25B *7/00*

U.S. Cl. 210—747 **8 Claims**



1. A method of separating liquid from particulate material by dielectrophoresis, said material being selected from the group comprising clays, silts, organic soils, peat moss, mine tailings, sewage and oil sands of a differing permittivity to which it is physically bound, said method comprising the steps of:

applying an AC voltage in the range of 1 to 100 kilo volts and at a frequency in the range of 0.01 to 100 Hz to an electrode electrically insulated from said material to create a non-uniform electric field of the same frequency as the applied AC voltage which decreases in strength the further the radial distance from the point of application, to induce flow of the liquid in the material; and

locating collection means in the path of induced flow to collect said liquid.

8. A method for consolidating soils in situ by dielectrophoresis, said material comprising the steps of:

connecting an AC voltage source and water removal means to a plurality of electrode assemblies;

embedding electrode assemblies into the soil; applying an AC voltage of between 1 to 100 kV and a frequency of between 0.01 to 100 Hz to an electrode insulated from said material; and

removing the water which collects at the electrode assembly.

4,960,525

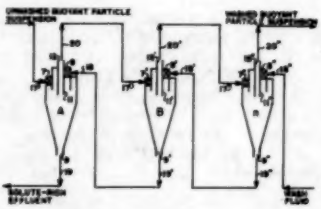
HYDROCYCLONE FOR WASHING PARTICLES IN LIQUID SUSPENSION

Glenn R. Dalby, Wilmington, Del., and Wolfgang K. Heiland, Trevose, Pa., assignors to The United States of America, as represented by the Secretary of Agriculture, Washington, D.C.

Filed Sep. 26, 1988, Ser. No. 248,743

Int. Cl.[5] B01D *21/26, 9/04*

U.S. Cl. 210—788 **10 Claims**



5. A process for separating and washing particulate solids from a liquid suspension wherein said particles have a specific gravity less than said liquid, said process being conducted in a hydrocyclone comprising a body having a cylindrical upper portion defining an upper region and a frustoconical lower portion defining a lower region, an axially oriented bottom outlet at the apex of the lower body portion, an axially oriented vortex finder and top outlet within the upper region, a vertically extending cylindrical skirt baffle having a lower extension terminating within said upper region and separating said upper region into an interior zone radially surrounding the vortex finder and an exterior zone radially surrounding the interior zone, a first inlet to the exterior zone of said upper region substantially tangential to the upper body portion, and a second inlet to the interior zone of said upper region substantially tangential to the skirt baffle, wherein said first and second inlets are radially separated from one another by the skirt baffle and wherein said first and second inlets are vertically spaced from one another, said process comprising:

a. introducing said liquid suspension into the first inlet;

b. introducing into the second inlet a wash fluid having a content of said particulate solids less than the particulate solids content of the liquid suspension;

c. withdrawing from the bottom outlet an effluent having at least a portion of the particulate solids removed; and

d. withdrawing washed particles from the top outlet.

4,960,526

DIAMMONIUM COMPOUND CONTAINING FABRIC SOFTENING AND ANTISTATIC DETERGENT COMPOSITION

Eduardo Puentes-Bravo, Liege; Marcel Gillis, Argenteau, and Andreas J. Somers, Tongeren, all of Belgium, assignors to Colgate-Polmolive Company, Piscataway, N.J.

Continuation of Ser. No. 158,042, Feb. 16, 1988, abandoned, which is a continuation of Ser. No. 876,999, Jun. 27, 1986, abandoned, which is a continuation-in-part of Ser. No. 758,821, Jul. 25, 1985, abandoned. This application Oct. 3, 1989, Ser. No. 418,731

Int. Cl.[5] **C11D** *1/62, 3/30;* **D06M** *13/332*

U.S. Cl. 252—8.8 **5 Claims**

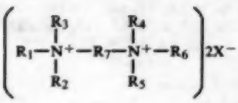
1. A free-flowing powdery or granular laundry detergent and softener and antistatic composition which consists of

(A) from about 1 to about 95% by weight of at least one detergent compound selected from the group consisting of anionic synthetic detergent, nonionic synthetic detergent, amphoteric synthetic detergent, zwitterionic synthetic detergent and mixtures thereof;

(B) from about 1 to about 50% by weight of at least one clay mineral fabric softener;

(C) from about 2 to about 80% by weight of at least one detergent builder;

(D) from about 0.2 to 5% by weight of at least one quaternary ammonium compound, said at least one quaternary ammonium compound being a water-soluble diammonium compound antistatic agent having the formula (I)

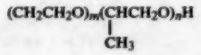


(I)

wherein

R_1 is an aliphatic hydrocarbon having from about 12 to about 30 carbon atoms,

each of R_2, R_3, R_4, R_5 and R_6 are independently selected from the group consisting of aliphatic hydrocarbon groups having from 1 to 22 carbon atoms with the proviso that the total number of carbon atoms in all the aliphatic hydrocarbon groups, including R_1, is no more than about 75 and with the further proviso that no more than three of the R_2–R_6 groups have more than 12 carbon atoms, and alkanol groups of the formula



wherein m and n are independently 0 or positive numbers with the sum of m and n from all of the groups R_2–R_6 being at least 2 but no more than 30, with the still further proviso that at least one of R_2–R_6 is said alkanol group, and

R_7 is a divalent linking group of at least 2 but not more than 100 carbon atoms, and

X is a water-soluble salt forming anion;

(E) form 0 to 2% by weight enzymes;

(F) from 0 to 15% by weight corrosion inhibitors;

(G) from 0 to 15% by weight anti-foam agents and suds suppressors;

(H) from 0 to 10% by weight soil suspending or antiredeposition agents and anti-yellowing agents;

(I) from 0 to 2% by weight colorants, perfumes, brighteners and bluing agents;

(J) from 0 to 5% by weight pH modifiers and pH buffers;

(K) from 0 to 40% by weight bleaching agent;

(L) from 0 to 15% by weight of bleach stabilizers and bleach activators; and

(M) moisture,

wherein said diammonium compound of formula (I) is present in the composition as a component of a spray-dried bead comprised of said diammonium compound, an anionic surfactant, detergent builder salt and, optionally, pH insensitive and heat stable detergent additives, fillers and mixtures thereof; and said at least one clay fabric softener is solely uniformly blended with said spray-dried beads.

4,960,527

DELAYED CROSSLINKING OF GUAR GELLING AGENTS WITH CERIC SALTS

Glenn S. Penny, Duncan, Okla., assignor to Rhone-Poulenc, Inc., Monmouth Junction, N.J.

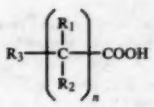
Continuation-in-part of Ser. No. 79,682, Jul. 30, 1987, abandoned. This application Jun. 19, 1989, Ser. No. 368,403

Int. Cl.[5] **E21B** *43/26*

U.S. Cl. 252—8.551 **29 Claims**

1. A retarding agent for delaying crosslinking of a guar gelling agent of an aqueous gel wherein a rare earth metal containing compound is utilized as a crosslinking agent and wherein the rare earth metal of the compound is a ceric moiety having a +4 oxidation state, the retarding agent comprising:

a first mixture containing about 1 part of a carboxylic acid and about 1 to 1000 parts of an alkali metal salt of the carboxylic acid, the carboxylic acid represented by a structural formula



wherein:

n takes on an integral value of from 0 to about 3;

R_1 and R_2 are H when n is an integer of from 1 to about 3; and

R_3 is a moiety selected from the group consisting of H, CH_3, HOOCCHCH,

COOH.

4,960,528

LUBRICATING OIL COMPOSITION

Armgard K. Everett, Warson Woods, and Edmund F. Perozzi, Crestwood, both of Mo., assignors to Ethyl Petroleum Additives, Inc., St. Louis, Mo.

Division of Ser. No. 281,262, Dec. 7, 1988, Pat. No. 4,960,530, which is a continuation-in-part of Ser. No. 175,761, Mar. 31, 1988, abandoned. This application Oct. 2, 1989, Ser. No. 415,580

Int. Cl.[5] **C10M** *105/72*

U.S. Cl. 252—32 **30 Claims**

1. A lubricating oil composition formulated for use in the crankcase of an internal combustion engine, said composition comprising a major amount of a lubricating oil and a minor wearinhibiting amount of the combination of (i) an overbased alkaline earth metal sulfonate having a total base number of at least 100, (ii) a zinc dihydrocarbyl dithiophosphate, (iii) a sulfurized carboxylic acid ester material, and (iv) a sulfurized fatty acid oxyalkylated amine derivative selected from sulfurized fatty acid amides, sulfurized fatty acid esters, and sulfurized fatty acid ester-amides of said oxyalkylated amine and mixtures thereof.

25. An additive concentrate adapted for addition to lubricat-

ing oil to provide a formulated lubricating oil for use in the crankcase of an internal combustion engine, said concentrate comprising an amount sufficient to inhibit engine wear when said formulated lubricating oil is used in said engine of a combination of (i) an overbased alkaline earth metal sulfonate having a total base number of at least 100, (ii) a zinc dihydrocarbyl dithiophosphate, (iii) a sulfurized carboxylic acid ester material, and (iv) a sulfurized fatty acid oxyalkylated amine derivative selected from the group consisting of sulfurized fatty acid amides, sulfurized fatty acid esters, and sulfurized fatty acid ester-amides of said oxyalkylated amine and mixtures thereof.

4,960,529

DIACYL HALIDES WITH AMINES AND PHOSPHITES AS MULTIFUNCTIONAL LUBRICANT ADDITIVES

Andrew G. Horodysky, Cherry Hill, N.J., and Shi-Ming Wu, Newtown, Pa., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Sep. 13, 1989, Ser. No. 406,474
Int. Cl.[5] C10M *109/00*
U.S. Cl. 252—32.5 **37 Claims**

1. A lubricant composition comprising a major proportion of an oil of lubricating viscosity or grease or other solid lubricant prepared thereform and a minor multifunctional antioxidant, antiwear or load carrying or extreme pressure amount of an additive product comprising the reaction product of diacyl generating species or mixtures of such species having from 0 to about 80 carbon atoms with C_6 to about C_{60} hydrocarbyl amines and organic phosphites.

26. A lubricating additive product prepared by (1) reacting a dicarboxylic acid with a thionyl halide in 3:1 to 1:3 molar ratio at temperatures varying from 0° C. to about 120° C. and (2) thereafter reacting the product of (1) a diacyl halide in situ with a suitable diaryl phosphite and an amine at temperature varying from ambient up to reflux and recovering said desired product.

4,960,530

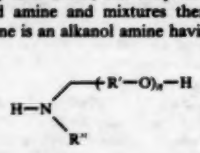
LUBRICATING OIL COMPOSITION

Armgard K. Everett, Warson Woods, and Edmund F. Perozzi, Crestwood, both of Mo., assignors to Ethyl Petroleum Additives, Inc., St. Louis, Mo.

Continuation-in-part of Ser. No. 175,761, Mar. 31, 1988, abandoned. This application Dec. 7, 1988, Ser. No. 281,262
Int. Cl.[5] C10M *135/04*
U.S. Cl. 252—32.7 R **30 Claims**

1. A composition comprising an oil of lubricating viscosity and from about 0.05 to about 25 percent by weight, based on the total weight of composition, of a cosulfurized blend of a carboxylic acid ester and a fatty acid oxyalkylated amine derivative selected from fatty acid amides, fatty acid esters, and fatty acid ester-amides of said oxyalkylated amine and mixtures thereof.

27. A lubricant oil additive concentrate comprising a diluent oil of lubricating viscosity and from about 2 to 25 weight percent, based on the total weight of concentrate, of a cosulfurized blend containing 40 to 60 wt % of a C_1–C_{20} alkyl ester of a C_8–C_{24} unsaturated fatty acid and 60 to 40 wt % of a C_8–C_{20} fatty acid oxyalkylated amine derivative selected from fatty acid amides, fatty acid esters, and fatty acid ester-amides of said oxyalkylated amine and mixtures thereof wherein the oxyalkylated amine is an alkanol amine having the formula:



wherein R′ is a divalent aliphatic hydrocarbon radical containing 2–4 carbon atoms, n is an integer from 1 to 10 and R″ is selected from hydrogen and the group —R′O)$_n$—H′.

4,960,531

ICE MELTER COMPRISING AN ALPHA-METHYL GLUCOSIDE AND METHOD OF MAKING SAME

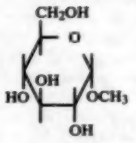
Margaret B. Connor, Watertown, and Joseph P. Tratnyek, Sudbury, both of Mass., assignors to Koos, Inc., Kenosha, Wis.

Filed May 5, 1989, Ser. No. 347,561
Int. Cl.[5] C09K *3/18, 5/00*
U.S. Cl. 252—70 **12 Claims**

1. An ice melter composition for use on driveways, sidewalks and the like comprising:

a salt combination and a trigger enhancing agent;

said trigger comprising alpha-methyl glucoside of the formulation



4,960,532

DUST SUPPRESSANT FORMING A RESILIENT LAYER

Henry A. Kremer, Richmond Hill, Canada, assignor to Carbochem Inc., Ontario, Canada

Continuation of Ser. No. 88,234, Aug. 24, 1987, abandoned. This application Oct. 26, 1988, Ser. No. 262,841
Int. Cl.[5] C09K *3/22*
U.S. Cl. 252—88 **32 Claims**

1. An aqueous dust suppressant concentrate comprising: based upon the weight of the concentrate,

from 80 to 45% water having a pH from about 7 to 9, and containing a water thickening agent dissolved in said water and forming with said water a dispersion medium, the amount of said thickening agent not exceeding 3% by weight of the water but being such as to obtain a dispersion medium having a viscosity, as measured by ASTM-D-4402 of at least 2000 centipoises at 25° C, and

from 20 to 55% by weight of a coal tar pitch dissolved in an aromatic solvent boiling substantially over 270° C., and forming a dispersed liquid, in said aromatic solvent being present in an amount that renders liquid said pitch during its making,

said dust suppressant concentrate being substantially free from surfactants, emulsifying and wetting agents,

2 to 10 part of said concentrate upon dilution and mixing with 98 to 90 parts of additional water yielding 100 parts by weight of a dilute aqueous dust suppressant being sprayable and able to form a thick crust of a resilient layer penetrating dusting materials.

4,960,533

SILICONE-BASED HARD SURFACE CLEANER

Karen L. Wisniewski, Bound Brook, and Mary L. Knudson, Somerville, both of N.J., assignors to Colgate-Palmolive Company, New York, N.Y.

Filed Jul. 11, 1988, Ser. No. 217,712
Int. Cl.[5] C11D *1/82*
U.S. Cl. 252—142 **2 Claims**

1. A completely emulsified liquid detergent exhibiting Marangoni effect spreading characteristics for cleaning hard surfaces consisting of 1 to 2 percent cyclomethicone, 1 to 2 percent polyethylene oxide modified dimethyl polysiloxane, 1 to 6 percent glutaric acid and water.

4,960,534

METHOD OF THICKENING AN AQUEOUS SOLUTION OF SULPHAMIC ACID

Douglas N. Smith, and Howard Goodman, both of St Austell, United Kingdom, assignors to ECC International Limited, United Kingdom

Filed Jan. 31, 1989, Ser. No. 304,802

Claims priority, application United Kingdom, Feb. 1, 1988, 8802161

Int. Cl.[5] C11D 7/08

U.S. Cl. 252—145 8 Claims

1. A method for preparing a thickened cleaning composition containing sulphamic acid, consisting essentially of the following steps:

(a) forming an aqueous suspension of a particulate smectite clay; and

(b) mixing the aqueous suspension with the sulphamic acid to form a thickened aqueous solution of the acid.

4,960,535

AZEOTROPE-LIKE COMPOSITIONS OF 1,1-DICHLORO-1-FLUOROETHANE, DICHLOROTRIFLUOROETHANE AND A MONO- OR DI-CHLORINATED C_2 OR C_3 ALKANE

Peter B. Logsdon, North Tonawanda; Leonard M. Stachura, Hamburg; Ellen L. Swan, Ransomville, and Rajat S. Basu, Williamsville, all of N.Y., assignors to Allied-Signal Inc., Morris Township, Morris County, N.J.

Filed Nov. 13, 1989, Ser. No. 435,842

Int. Cl.[5] C11D 7/30, 7/50

U.S. Cl. 252—171 23 Claims

1. Azeotrope-like compositions consisting essentially of from about 25 to about 99 weight percent 1,1-dichloro-1-fluoroethane, from about 1 to about 72 weight percent dichlorotrifluoroethane selected from the group consisting of 1,1-dichloro-2,2,2-trifluoroethane, 1,2-dichloro-1,2,2-trifluoroethane and a mixture of 1,1-dichloro-2,2,2-trifluoroethane and 1,2-dichloro-1,2,2-trifluoroethane and from about 0.1 to about 5 weight percent of a mono- or dichlorinated C_2 or C_3 alkane selected from the group consisting of 1-chloropropane, 2-chloropropane and 1,1-dichloroethane wherein said compositions with 1-chloropropane or 2-chloropropane boil at about 31.9° C. at 760 mm Hg and said compositions with 1,1-dichloroethane boil at about 31.4° C. at 760 mm Hg.

4,960,536

CARBOXYALKYLATED DERIVATIVES OF ALKYL AND ALKENYL CATECHOL ETHOXYLATES AND DETERGENT COMPOSITIONS CONTAINING SAME

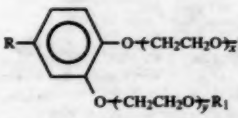
Robert V. Casciani, Charlotte, N.C., assignor to Sandoz Ltd., Basel, Switzerland

Filed Mar. 9, 1989, Ser. No. 321,421

Int. Cl.[5] C07C 59/71; C11D 1/06

U.S. Cl. 252—174.19 19 Claims

1. A compound of formula I:



I

wherein

R is C_8–$C_>$ straight or branched chain alkyl or alkenyl;

each R_1, independently, is hydrogen or a group $—R_2.COOM$, where R_2 is C_{1-3} alkylene and M is hydrogen, an alkali metal cation, an alkaline earth metal cation or ammonium; and

each of x and y is, independently, an integer 1 to 49; with the provisos that: (1) at least one of the R_1's is a group $—R_2.COOM$; and (2) the sum of x and y is 3 to 50.

4,960,537

PROCESS AND COMPOSITIONS FOR PRODUCTION OF MOLDINGS

Neil H. Nodelman, Pittsburgh, Pa., assignor to Mobay Corporation, Pittsburgh, Pa.

Division of Ser. No. 310,142, Feb. 13, 1989, Pat. No. 4,937,366. This application Feb. 15, 1990, Ser. No. 480,415

Int. Cl.[5] C09K 3/00

U.S. Cl. 252—182.28 3 Claims

1. An isocyanate-reactive mixture comprising

(i) an organic active hydrogen containing material having a molecular weight of from 1000 to 8000 and containing at least two active hydrogen groups, and

(ii) the reaction product of

(a) an aromatic diamine which contains at least one non-reactive substituent in the ortho position to a first amino group and at least one non-reactive substituent in the ortho position to a second amino group, and

(b) a cyclic carboxylic acid anhydride at a molar ratio of component (a) to component (b) of from 3:1 to 15:1.

4,960,538

1,2-NAPHTHALOCYANINE NEAR-INFRARED ABSORBENT AND RECORDING/DISPLAY MATERIALS USING SAME

Hisato Itoh; Takahisa Oguchi, both of Yokohama; Katashi Enomoto, Zushi; Masakatsu Nakatsuka, and Tsutomu Nishizawa, both of Yokohama, all of Japan, assignors to Mitsui Toatsu Chemicals, Inc, Tokyo and Yamamoto Chemicals, Inc., Yao, both of, Japan

Filed Oct. 20, 1988, Ser. No. 260,038

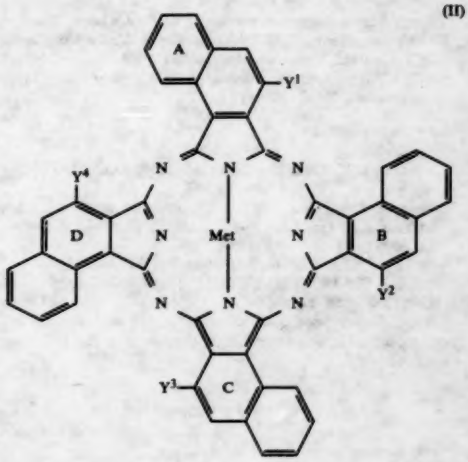
Claims priority, application Japan, Oct. 20, 1987, 62-262593; Apr. 12, 1988, 63-90030

Int. Cl.[5] C09K 19/58; C09B 47/04

U.S. Cl. 252—299.2 16 Claims

1. A near-infrared absorbent, comprising 1,2-naphthalocyanine derivatives having a substituent group at the α-position of each naphthalene ring as represented by the formula (II):

(II)



wherein the naphthalene rings represented by A, B, C and D are, independently, substituted with 0–5 substituents selected from alkyl, alkoxy, alkylthio, monoalkylamino, dialkylamino, aryl, aryloxy, arylthio, arylamino groups and halogen atoms; any two adjacent substituents on a naphthalene ring may be bonded to form a ring; Met is two hydrogen atoms, a divalent metal atom, a monosubstituted trivalent metal atom, a disubstituted tetravelent metal atom or an oxymetal group; Y^1, Y^2, Y^3, Y^4, independently, are alkyl groups, alkoxyl groups, aryloxy

groups, alkylthio groups, arylthio groups and aralkyl groups; and each of these substituent groups may be substituted with one or more halogen atoms, alkoxyl groups, alkoxyalkoxyl groups, aryloxy groups, alkylthio groups, arylthio groups or cycloalkyl groups.

4,960,539

USE OF FLUOROMETHYLPHENOLS AS SOLVENTS FOR LC-POLYMERS, AND NEW FLUOROMETHYLPHENOLS

Rainer Kuhn, Odenthal; Albrecht Marhold, Leverkusen, and Hans-Rudolf Dicke, Krefeld, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

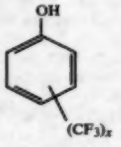
Continuation of Ser. No. 174,654, Mar. 29, 1988, abandoned. This application Nov. 2, 1989, Ser. No. 431,677

Claims priority, application Fed. Rep. of Germany, Apr. 15, 1987, 3712817

Int. Cl.[5] C09K *19/52*

U.S. Cl. 252—299.5 **12 Claims**

1. A composition comprising a solution of a liquid-crystalline polymer, said liquid-crystalline polymer selected from the group consisting of polyesters, polythiol esters, polyester amides, polyester imides, polyazonethines and polyester carbonates, and a solvent, said solvent being a compound of the formula



wherein

x represents an integer of from 1 to 5 and said compound comprising either no further ring substituents other than hydrogen or being substituted by 1 to 4 substituents selected from the group consisting of C_1–C_4 alkyl, fluorine, chlorine, fluoro-C_1–C_4 alkyl, chloro substituted fluoro-C_1–C_4-alkyl, bromo substituted fluoro-C_1–C_4-alkyl, C_1–C_4 alkoxy, fluoro substituted C_1–C_4 alkoxy and chloro substituted C_1–C_4 alkoxy.

4,960,540

ALKOXYLATED BIS-AMIDE DEFOAMING COMPOUNDS

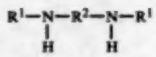
Thomas C. Friel, Jr., 3 Bitterroot La., Savannah, Ga., and Anthony J. O'lenick, Jr., 4437 Park Dr., Suite E, Norcross, Ga. 30093

Filed Aug. 24, 1989, Ser. No. 397,998

Int. Cl.[5] C07C *233/01;* **B01D** *19/04;* **D21C** *3/28*

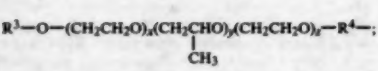
U.S. Cl. 252—358 **13 Claims**

1. A defoaming composition containing an effective defoaming amount of a defoamer which conforms to the following structure;



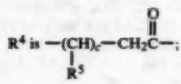
wherein;

R^1 is



R^2 is $-(CH_2)_a-$;

R^3 is alkyl C_{12} to C_{20};



x,y,z are each independently integers from 0 to 20;

a is an integer from 1 to 5;

c is an integer from 0 to 5;

R^5 is selected from H, CH_3, C_2H_5, C_3H_6.

4,960,541

AQUEOUS LIQUID DETERGENTS CONTAINING AN N-ACYL-ASPARTATE, AMINE OXIDE AND ALKYL ETHER SULFATE

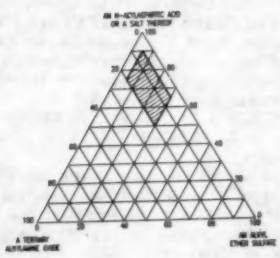
Takazumi Kanekiyo, Mie, Japan, assignor to Mitsubishi Petrochemical Co., Ltd., Tokyo, Japan

Filed Aug. 31, 1989, Ser. No. 400,927

Claims priority, application Japan, Sep. 30, 1988, 63-246095

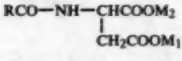
Int. Cl.[5] A61K *7/50;* **C11D** *1/10, 1/29, 1/75*

U.S. Cl. 252—546 **4 Claims**



1. A fluid aqueous liquid detergent composition containing a detergent effective amount of a surfactant mixture containing

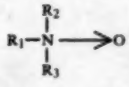
(a) an N-acylaspartic acid or a salt thereof represented by formula (I):



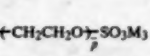
(I)

wherein R represents an alkyl or alkenly group having from 7 to 21 carbon atoms; and M_1 and M_2 each represents a hydrogen atom or a cation derived for Na, K, NH_4 or an alkanolamine,

(b) a tertiary alkylamine oxide represented by formula (II):



wherein R_1 represents an alkyl or alkenyl group having from 10 to 18 carbon atoms; and R_2 and R_3 each represents an alkyl group having from 1 to 3 carbon atoms, and (c) an alkyl ether sulfate represented by formula



(III)

wherein R_4 represents an alkyl or alkenyl group having from 7 to 20 carbon atoms; p represents an average number of moles of ethylene oxide added and is selected from an integer of from 1 to 5; and M_3 represents a cation derived from Na, K, NH_4 or an alkanolamine, the weight

relative proportions of the components (a), (b), and (c) falling within the range indicated by a quadrate formed by four points (90,5,5), (75,20,5), (50,20,30), and (65,5,30) in a triangular coordinate constructed by placing the pure components (a), (b), and (c) at the vertices of a regular triangle.

4,960,542

LUBRICATING OIL COMPOSITION

Hiromichi Seiki, Ichihara, Japan, assignor to Idemitsu Kosan Company Limited, Tokyo, Japan

Continuation of Ser. No. 183,744, Apr. 11, 1988, abandoned. This application Oct. 16, 1989, Ser. No. 423,603

Claims priority, application Japan, Sep. 8, 1986, 61-209635

Int. Cl.[5] C10M *105/32*

U.S. Cl. 252—565 **12 Claims**

1. A lubricating oil composition for a wet brake or wet clutch comprising 97 to 60% by weight of mineral oil and 3 to 40% by weight of polyester, said mineral oil having a kinematic viscosity at 100° C. of 2 to 50 centistokes, a pour point of lower than −30° C. and a viscosity index of at least 70, and wherein the polyester is a hindered ester or a dicarboxylic acid ester.

4,960,543

URETHANE MADE FROM ALIPHATIC FLUORINATED ALCOHOLS, ISOCYANATES AND SUBSTITUTED AROMATIC COMPOUNDS, A PROCESS FOR THEIR PREPARATION, AND THEIR USE

Frank Wehowsky, Burgkirchen; Rolf Kleber, Neu-Isenburg, and Lothar Jaeckel, Flörsheim am Main, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

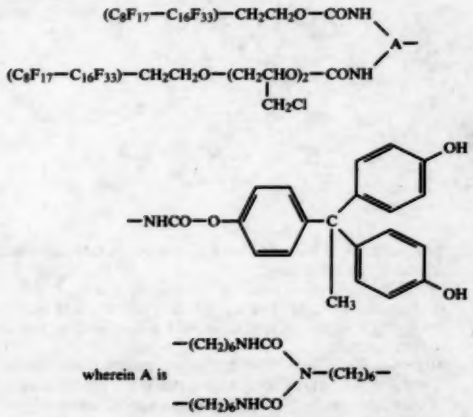
Filed Dec. 27, 1988, Ser. No. 289,913

Claims priority, application Fed. Rep. of Germany, Dec. 29, 1987, 3744423

Int. Cl.[5] C09B *11/06*

U.S. Cl. 560—26 **1 Claim**

1. A urethane made from an aliphatic fluorinated alcohol an isocyanate and a substituted aromatic compound of the formula



4,960,544

FRACTIONATION OF FAT BLENDS

Karel P. Van Putte, Maasland, and Johannes J. Muller, Rotterdam, both of Netherlands, assignors to Lever Brothers Company, New York, N.Y.

Continuation of Ser. No. 395,170, Aug. 17, 1989, abandoned, which is a continuation of Ser. No. 57,073, Jun. 2, 1987, abandoned. This application Mar. 16, 1990, Ser. No. 496,066

Claims priority, application United Kingdom, Jun. 4, 1986, 8613528; Netherlands, Nov. 3, 1986, 8602775

Int. Cl.[5] C11C *3/00*

U.S. Cl. 260—420 **17 Claims**

1. A process for fractionating a fat blend, which comprises
(a) producing a mixture comprising a fat blend and a diluting liquid oil which is substantially free from crystallized fat at 10° C.;
(b) heating the mixture obtained to a temperature above the melting point;
(c) cooling the mixture in two stages, the first stage being performed at a relatively high cooling rate and the second stage being performed at a relatively slow cooling rate, while stirring under mild shear conditions to avoid settling of crystals and formation of fine crystals.
(d) separating the higher melting stearin fraction from a mixture of the lower melting olein fraction and liquid oil.

4,960,545

DEVICE FOR FEEDING A CARBURATION ENGINE IN SPECIAL OPERATING CONDITIONS

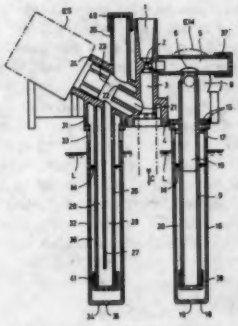
Marco Morini, Via Ponte Romano 108, I. 11027 Saint Vincent, Italy

Filed Sep. 13, 1989, Ser. No. 406,572

Claims priority, application Italy, Sep. 30, 1988, 67875 A/88

Int. Cl.[5] F02M *1/06*

U.S. Cl. 261—41.5 **6 Claims**



1. A unit intended to supply gasoline and air mixture to an internal combustion engine in special operating conditions, such as operation at minimum speed, the start period, operation as motor-brake and/or acceleration, said engine having an intake and a carburetor connected to said intake and including a shutter and a fuel bowl wherein a constant level of gasoline is maintained,

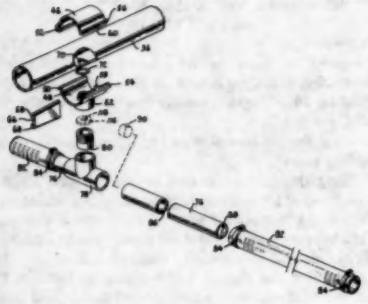
wherein the unit comprises: a main air intake in the form of a venturi tube having a restricted cross section, connected to the engine intake downstream the carburetor shutter; a supply jet for operation at minimum speed, having a fuel supply and at least one own air intake and opening in the restricted cross section of said main air intake; a jet for the operation during the start period, comprising a fuel supply and at least one own air intake and opening in said main air intake downstream the restricted cross section thereof; and two solenoid valves arranged to independently cut off, when activated, the one or the other jet or both.

4,960,546

DIFFUSER MOUNTING ARRANGEMENT FOR WASTE WATER AERATION SYSTEMS

Charles E. Tharp, 504 Stalcup, Columbia, Mo. 65201, assignor to Charles E. Tharp, Columbia, Mo.

Filed Apr. 19, 1989, Ser. No. 340,265
Int. Cl.[5] B01F *3/04*
U.S. Cl. 261—122 **18 Claims**



1. In a waste water aeration system having a submerged pipe supplied with air under pressure, the improvement comprising;

means for providing an outlet port in said pipe for discharging air therefrom;

a mounting saddle comprising first and second saddle sections, said first saddle section having an outlet fitting thereon;

means for clamping said first and second saddle sections on the pipe with said outlet fitting in registration with said outlet port to receive air therefrom and with said saddle sections surrounding said pipe for structural reinforcement thereof at the outlet port location;

a diffuser Tee fitting providing a flow passage therethrough and having an inlet and a pair of axially aligned outlets;

means for establishing a threaded connection between said outlet fitting and the inlet of said diffuser Tee fitting to mount the diffuser fitting with said flow passage disposed to receive air from the outlet fitting; and

an elongate tubular diffuser connected with each outlet of said diffuser Tee fitting in a manner to receive air from said flow passage, each diffuser having means for discharging air into the waste water in bubbles and said diffusers extending horizontally in opposite directions from the outlets of said Tee fitting.

4,960,547

DEVICE AND METHOD FOR THE GRANULATION OF MELTING AND SOFTENING MATERIALS

Michael Reinhard, Waldstr. 9, D-6117 Schaafheim, Fed. Rep. of Germany

PCT No. PCT/DE88/00170, § 371 Date Nov. 16, 1988, § 102(e) Date Nov. 16, 1988, PCT Pub. No. WO88/06961, PCT Pub. Date Sep. 22, 1988
PCT Filed Mar. 18, 1988, Ser. No. 274,934
Claims priority, application Fed. Rep. of Germany, Mar. 18, 1987, 3708695
Int. Cl.[5] B29B *9/10*
U.S. Cl. 264—11 **26 Claims**

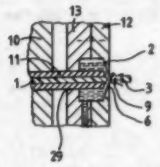
19. A method for granulating molten material, said method comprising the steps of:

causing said molten material to flow through at least one channel and out of an end surface thereof;

causing said molten material flowing from said end surface to further flow through an opening in an adjacent plate, said opening corresponding to said at least one channel;

introducing a pressure medium to an accumulating region located adjacent the end surface of said at least one channel; and

periodically moving one of said channel and said plate with



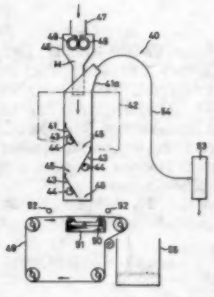
respect to the other to allow periodic introduction of discrete amounts of said pressure medium to the flow of the molten material and thereby dividing the molten material into discrete granules.

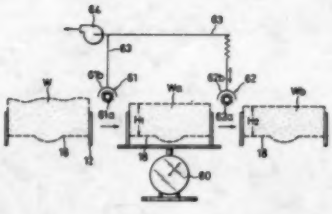
4,960,548

METHOD OF MANUFACTURING MOLDED WOODEN PRODUCT

Sadao Ikeda, and Yoshio Taguchi, both of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Continuation of Ser. No. 79,020, Jul. 29, 1987, abandoned. This application Mar. 24, 1989, Ser. No. 328,818
Claims priority, application Japan, Aug. 6, 1986, 61-184774
Int. Cl.[5] B01D *45/02*; B29C *43/02*
U.S. Cl. 264—40.4 **3 Claims**





1. A method of manufacturing a molded wooden product comprising the steps of:

preparing a ligneous molding material by adding a binder consisting essentially of a synthetic resin to wood fibers;

removing a portion of said ligneous molding material that is rich in binder;

adjusting the weight of said molding material in a fibrous state or in a state of being aggregated into a predetermined configuration by evenly shaving an upper surface of said molding material, weighing the remaining material mass,

calculating the amount of remaining material mass to be shaved off on the basis of the result of said weighing to obtain a preset weight, and shaving said remaining mass again by the calculated amount; and

hot compression molding said molding material.

4,960,549

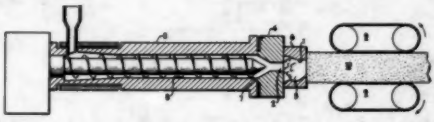
PROCESS FOR PREPARING POLYAMIDE-IMIDE FOAM

Gary T. Brooks, Naperville; Brian C. Connolly, Aurora, and Robert Riley, Plano, all of Ill., assignors to Amoco Corporation, Chicago, Ill.

Filed May 23, 1988, Ser. No. 197,208

Int. Cl.[5] B29B *11/10*

U.S. Cl. 264—45.5 **8 Claims**



1. A process for producing polyamide-imide foam comprising heating in an extruder a polyamide-imide capable of releasing volatiles comprising water vapor and carbon dioxide on heating, to form a foamable composition comprising softened, fused polyamide-imide and volatiles comprising water and carbon dioxide, extruding the foamable composition through an outlet of the extruder into a zone having greater cross-sectional area than the outlet and adapted to receive the extruded foamable composition and provide a boundary for limiting expansion of the foamable composition in a plane normal to the direction of passage of the composition through the zone, expanding the foamable composition in the zone, cooling the expanded composition and removing the expanded composition from the zone.

4,960,550

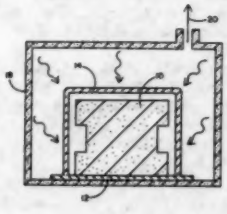
ENCAPSULATION METHOD FOR HOT ISOSTATIC PRESSING

Joseph M. Wright, Santa Ana, Calif., assignor to Ford Aerospace Corporation, Newport Beach, Calif.

Filed Jul. 20, 1989, Ser. No. 382,865

Int. Cl.[5] C04B *35/64*

U.S. Cl. 264—56 **8 Claims**



1. A method for the hot isostatic pressing of a ceramic preform, comprising the steps of:

(a) providing a container including at least two glass parts adapted to contact each other along a continuous closed line when placed around said preform;

(b) placing said parts in non-airtight contact with each other about said preform in a heatable pressure vessel;

(c) drawing a vacuum in said pressure vessel;

(d) heating said evacuated pressure vessel to a temperature at which said parts sealingly bond to one another along said line but do not collapse against said preform;

(e) pressurizing said vessel after said parts have bonded together; and

(f) applying sufficient additional heat and pressure to collapse said glass parts against the surface of said preform.

4,960,551

METHOD OF PRODUCING MODIFIED LEAD BARIUM TITANATE CERAMIC USEFUL AS PTC THERMISTOR

Takamitsu Eonomoto; Hiroshi Ueda; Midori Kawahara; Naoki Okada, and Noboru Murata, all of Ube, Japan, assignors to Central Glass Company, Limited, Ube City, Japan

Filed Nov. 21, 1988, Ser. No. 273,811

Claims priority, application Japan, Nov. 28, 1987, 62-298919

Int. Cl.[5] C04B *35/46*

U.S. Cl. 264—65 **6 Claims**

1. A method of producing a modified lead barium titanate ceramic which has a fundamental composition represented by the general formula $(Ba_{1-x-y}Sb_yPb_x)TiO_3$, where x is not greater than 0.9 and y is from 0.001 to 0.1, and has a positive temperature coefficient of resistivity over a range of temperature higher than about 350° C. at the lower boundary, the method comprising the steps of:

preparing a mixure of metal-oxygen compounds, which are sufficient as the sources of Ba, Pb, SSb and Ti in said titanate ceramic and include as the source of Pb in said titanate ceramic a lead-containing compound obtained by thermal decomposition of a metal salts of an organic acid, and a combination of additives, said combination comprising BN amounting to 0.01–4.0 atom% of said fundamental composition and at least one other additive selected from the group consisting of $BaCO_3$, SiO_2 and TiO_2, the amount of said $BaCO_3$ being not more than 1.0 atom% of said fundamental composition, the amount of said SiO_2 being not more than 2.0 atom% of said fundamental composition, the amount of said TiO_2 being not more than 1.0 atom% of said fundamental composition;

compacting the prepared mixture into a desired shape; and

sintering the compacted mixture in an oxidizing atmosphere.

4,960,552

PRODUCTION OF SHEETLIKE PRESHAPES

Michael Portugall, Wachenheim; Franz Schumacher, Gruenstadt, and Erhard Seiler, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Feb. 13, 1987, Ser. No. 14,545

Claims priority, application Fed. Rep. of Germany, Feb. 15, 1986, 3604829

Int. Cl.[5] B29C *47/14*

U.S. Cl. 264—108 **1 Claim**

1. A process for producing a sheetlike, thermoplastically moldable preshape based on a liquid-crystalline polymer and composed of two or more layers in which the polymer is oriented in different directions, which comprises melting the polymer in an extruder, dividing the melt into two or more separate streams, then conferring different directions of orien-

tation on the polymer in the separate streams, recombining the separate streams before the discharge orifice of the extruder die before the polymer solidifies, and extruding the recombined single melt stream as a sheetlike preshape.

4,960,553

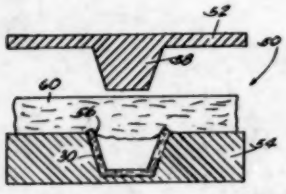
METHOD FOR FORMING ARTICLES HAVING DEEP DRAWN PORTIONS FROM MATTED WOOD FLAKES

Gordon R. DeBruine, Tacoma, Wash.; Bruce A. Hantaja, Lake Linden, and L. Bogue Sandberg, Chassell, both of Mich., assignors to Board of Control Michigan Technological University, Houghton, Mich. and Weyerhaeuser Co., Tacoma, Wash.

Filed Feb. 12, 1990, Ser. No. 478,834

Int. Cl.[5] B65D *19/31*; B29C *43/18*; B32B *31/04*

U.S. Cl. 264—113 17 Claims



1. A method for forming an article having a major plane and at least one non-planar portion displaced from the major plane, said method including the steps of:

(a) admixing a resinous particle board binder with flake-like wood particles to produce a preform furnish;

(b) forming a preform of only said non-planar portion from said preform furnish;

(c) admixing a resinous particle board binder with flake-like particles to produce a mat furnish;

(d) with said preform located in a cavity in an open part of an article-forming mold including separable parts defining a mold chamber having the shape of the article, depositing a loosely-felted mat formed from said mat furnish on the open part of the article-forming mold and over the cavity in which said preform is located; and

(e) closing the article-forming mold and applying sufficient heat and pressure on said mat and said preform to compress them into substantially the desired shape and size of the article and to bond the wood particles of said mat and said preform together to form a unitary structure.

12. A method for molding a material handling pallet having a deck and a plurality of hollow leg members projecting integrally from the deck member, each leg member having a bottom wall spaced from the deck member and side walls integrally connecting the bottom wall to the deck, said method including the steps of:

(a) admixing a resinous particle board binder with flake-like wood particles to produce a preform furnish;

(b) forming preforms of said leg members from said preform furnish;

(c) admixing a resinous particle board binder with flake-like wood particles to produce a mat furnish;

(d) with said leg member preforms located in leg member-forming cavities in a pallet-forming mold including separable male and female dies defining a mold chamber having the shape of the pallet, depositing a loosely-felted mat formed from said mat furnish on the female die and covering the cavities containing said preforms; and

(d) closing the pallet-forming mold and applying sufficient heat and pressure on said mat and said preforms to compress them into substantially desired shape and size of the pallet and to bond the wood particles of said mat and said preforms together to form a unitary structure.

4,960,554

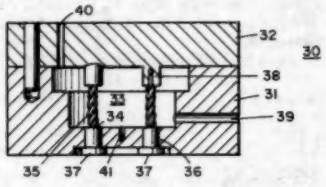
METHOD FOR MAKING HELICALLY WOUND EXTRUDATE PARTICLES

William E. Bambrick, Old Greenwich, Conn., assignor to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 785,185, Oct. 7, 1985, Pat. No. 4,673,664. This application May 21, 1987, Ser. No. 52,811

Int. Cl.[5] B29C *47/12*

U.S. Cl. 264—219 3 Claims



1. A process for making an extrusion die, useful for forming extrudates of inorganic oxide extrusion paste, with helical extrusion holes through the die for forming helical extrudates having the outer surface shape of three or four segments extended along the particle length and helically wound about the longitudinal axis of extrusion, said process comprising

molding an extrusion die of hardenable molding material in a mold having more than one helical pin shafts for forming helical extrusion holes in the molded die, each pin shaft having the outer helical surface shape of the helical extrudate to be formed by said die, and each pin shaft in the mold extending through the length of said die and being fixed at its position in the mold and rotatable at said position;

hardening the molded die material in said mold;

removing the hardened die from the mold by rotating each of the helical pin shafts at its fixed position to unscrew each pin from the helical extrusion hole it has formed in the die.

4,960,555

POLY (ARYLENE THIOETHER) BLOCK COPOLYMER FIBERS AND PRODUCTION PROCESS THEREOF

Yoshikatsu Satake, Iwaki; Shinji Yamamoto, Urawa; Takashi Kaneko, Tokyo; Masahito Tada, Matsudo; Ken Kashiwadate, Iwaki; Toshiya Mizuno, Tsuchiura; Hiroyuki Endo, Shimoinayoshi; Takayuki Katto, Iwaki, and Zenya Shiiki, Narashino, all of Japan, assignors to Kureha Kagaku Kogho K.K., JPX

Division of Ser. No. 424,638, Oct. 20, 1989. This application Mar. 28, 1990, Ser. No. 500,163

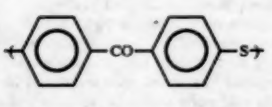
Claims priority, application Japan, Oct. 25, 1988, 63-267290; Nov. 15, 1988, 63-286836; Sep. 26, 1989, 63-248086

Int. Cl.[5] B29C *49/08*, *55/00*

U.S. Cl. 264—288.4 5 Claims

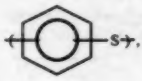
1. A process for the production of poly(arylene thioether) block copolymer fibers from a thermoplastic material composed of:

(A) 100 parts by weight of a poly(arylene thioether) block copolymer (Component A) alternately comprising (X) at least one poly(arylene thioether-ketone) block having predominant recurring units of the formula



wherein the —CO— and —S— are in the para position to each

other and (Y) at least one poly(arylene thioether) block having predominant recurring units of the formula



(a) the ratio of the total amount of the poly(arylene thioether) block (Y) to the total amount of said the poly(arylene thioether-ketone) block (X) ranging from 0.05 to 5 by weight,

(b) the average polymerization degree of the poly(arylene thioether) block (Y) being at least 10, and

(c) said block copolymer having a melt viscosity of 50–100,000 poises as measured at 350° C. and a shear rate of 1,200/sec;

(B) optionally, up to 50 parts by weight of at least one other thermoplastic resin (Component B); and

(C) optionally, up to 10 parts by weight of at least one filler (Compenent C), which comprises melt-extruding the thermoplastic material at 300°–400° C. through a spinneret, stretching the the resultant filaments at 90°–190° C. and a draw ratio of 1.2–8 times, and then heat-setting the thus-stretched filaments at 100°–340° C. for 0.1–1000 seconds.

4,960,556

METHOD FOR CRYSTALLIZING THERMOPLASTIC MATERIAL

Ulla Oehlenschlaeger; Jan R. Pedersen, and Erling Sörensen, all of Odense, Denmark, assignors to PLM AB, Malmo, Sweden

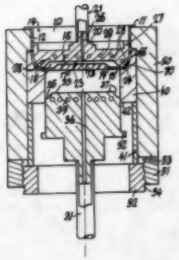
PCT No. PCT/SE88/00130, § 371 Date Nov. 15, 1988, § 102(e) Date Nov. 15, 1988, PCT Pub. No. WO88/06962, PCT Pub. Date Sep. 22, 1988

PCT Filed Mar. 15, 1988, Ser. No. 275,536

Claims priority, application Sweden, Mar. 17, 1987, 8701088

Int. Cl.[5] B29C *43/04, 43/56*

U.S. Cl. 264—322 **14 Claims**



1. A method of crystallizing and shaping the bottom of a cup which is made of amorphic crystallizable thermoplastic material, said method comprising supporting a cup of thermoplastic material in a mold such that an amorphic bottom of the cup extends across the bottom of an opening in the mold, heating the material of said bottom of the cup to an elevated temperature exceeding the glass transition temperature (TG) thereof wherein the temperature is at least 140° C. applying compressive force to the heated material for at least 10 seconds at said bottom of the cup while said material is at said elevated temperature by applying mechanical pressing elements against said bottom of the cup at opposite surfaces thereof at said bottom of the opening in the mold, the mechanical pressing elements reducing the thickness of said material, terminating the application of compressive force and cooling the material, the amorphic material being crystallized due to heating and pressure while the bottom of the cup is compressed and reduced in thickness by the mechanical pressing elements, the time for the material to become crystallized being shortened compared to crystallization by heating along.

4,960,557

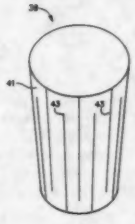
METHOD OF INJECTION MOLDING THIN-WALLED PLASTIC PRODUCTS

Jens O. Sorensen, Rancho Santa Fe, Calif., assignor to Acebo Company, La Jolla, Calif.

Division of Ser. No. 27,511, Mar. 18, 1987, Pat. No. 4,807,775, which is a continuation-in-part of Ser. No. 7,463, Jan. 26, 1987, Pat. No. 4,844,405. This application Feb. 13, 1989, Ser. No. 310,059

Int. Cl.[5] B29C *45/26*

U.S. Cl. 264—328.12 **4 Claims**



1. A method for injection molding a plastic product having a thin-walled area, comprising the steps of

(a) injecting molten plastic from a gate into a mold cavity defined by and positioned between a first mold part and a second mold part and encompassed by a parting line, for forming the plastic product; wherein the mold parts define a thin cavity region for defining the thin-walled area of the plastic product, and first and second flow channels defining boundaries of the thin cavity region;

(b) directing the injected molten plastic from the gate through the flow channels into the thin cavity region, whereby the molten plastic directed from the first flow channel joins with the molten plastic directed from the second flow channel; and

(c) melding the molten plastic directed from the first flow channel with the molten plastic directed from the second flow channel in a meld chamber defined by the mold parts, the meld chamber being a portion of the mold cavity that is thicker than the thin cavity region, the meld chamber being at least partially located extensively between the flow channels where molten plastic directed into the thin cavity region by the first flow channel joins molten plastic directed into the thin cavity region by the second flow channel, wherein the meld chamber is displaced from the gate and the flow channels for enhancing the melding of plastic flowing from different directions into and joining together in the meld chamber.

4,960,558

PROCESS FOR THERMOFORMING MULTIHUED LAMINATE FILMS

William T. Short, Southfield, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Aug. 17, 1988, Ser. No. 233,312

Int. Cl.[5] B29C *51/02*

U.S. Cl. 264—510 **13 Claims**

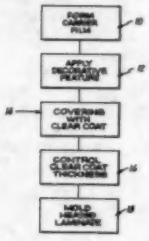
1. A process for making a thermoformed part of painted carrier films molded to substrates for providing a one step finishing process comprising the steps of:

providing a polymeric carrier film;

coating the carrier film with a color coat having a predetermined gloss and color hue;

depositing a variable thickness a clearcoat of a uniform material to the color coat to cover a full surface area of the color coat; and

molding the coated carrier film to form a surface of a relatively rigid substrate to produce a finished product with



the variable thickness clearcoat conforming substantially to the thickness of the initially deposited clearcoat so as to produce a variable surface appearance in an exposed surface of the thermoformed part which varies in accordance with the variances in the starting thickness of the clearcoat and which follows an initial chroma of the color coat.

4,960,559

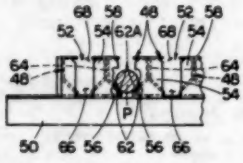
CAPTURE ROW STORAGE TRAY FOR HOLDING COLLATED ROWS OF NUCLEAR FUEL PELLETS

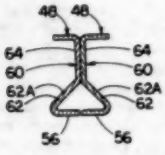
James L. Fogg, Columbia, S.C., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed May 17, 1989, Ser. No. 353,304

Int. Cl.[5] G21C *21/00*

U.S. Cl. 376—261 **23 Claims**





15. A capture row storage tray for holding rows of nuclear fuel pellets, said tray comprising:

(*a*) an array of laterally spaced elongated guide members extending substantially parallel to one another; and

(*b*) means attached to said guide members for mounting said guide members in said array;

(*c*) pairs of said guide members in said array thereof defining elongated channels therebetween extending substantially parallel to one another, each channel being open at one end for receiving a plurality of nuclear fuel pellets therethrough, said guide members having means attached thereto for blocking said channel at an opposite end to prevent passage of the pellets therethrough;

(*d*) said guide members of each pair having laterally spaced apart and converging side portions for confining the pellets in said channel and for guiding the pellets into an end-to-end aligned relationship within said channel;

(*e*) said guide members of each pair having laterally spaced bottom portions attached to said mounting means and which define an elongated open gap of a width less than the diameter of the pellets for capturing the pellets in said channel, said gap being located below and substantially aligned with the pellets in their end-to-end aligned relationship within said channel for permitting entry of heat into said channel through said gap from below said guide-members during a subsequent heat treatment application to the pellets while held in the rows thereof on said tray;

(*f*) said guide members of each pair having laterally spaced top portions which define an elongated open slot of a width less than the diameter of the pellets for capturing the pellets in said channel, said slot being located above and substantially aligned with the pellets in their end-to-end aligned relationship within said channel for permitting entry into said channel through said slot of a member for engaging the pellets to cause slidable movement thereof along said channel.

4,960,560

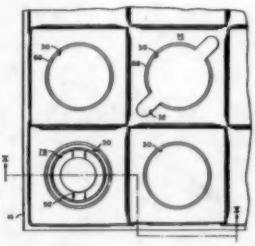
SPENT FUEL STORAGE RACK FOR BWR FUEL ASSEMBLIES

Octavio Machado, Pensacola, Fla.; Clifford W. Henry, Metairie, La.; Ray L. Congleton, Cantonment, and William M. Flynn, Pensacola, both of Fla., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Division of Ser. No. 728,141, Apr. 26, 1985, abandoned, and a continuation of Ser. No. 147,822, Jan. 25, 1988, abandoned, and Parent of continuation of Ser. No. 149,982, Dec. 29, 1988, now U.S. Pat. No. 4,900,505. This application Dec. 11, 1989, Ser. No. 449,324

Int. Cl.[5] G21C *19/40*

U.S. Cl. 376—272 **3 Claims**



1. For the use in storing a plurality of nuclear fuel assemblies in a storage pool containing a coolant and having a pool floor, a fuel rack module comprising:

(a) a base plate to be disposed generally horizontally on said floor and having a horizontal surface area sufficient to support a plurality of fuel assemblies;

(b) a plurality of uniformly spaced openings in said base plate, disposed in rows and columns throughout said surface area;

(c) a plurality of fabricated cells of rectangular cross section extending over alternate openings along each row of said openings, the fabricated cells of each row being uniformly staggered by one opening with respect to the cells of its just adjacent rows so that said fabricated cells form a checkerboard like array;

(d) each of said fabricated cells having elongated walls mounted generally vertically on said base plate;

(e) each of the corners formed by the walls of each fabricated cell, which corners are internal of the periphery of said array, being disposed as closely adjacent as practicable to and face-to-face with a corner of an adjacent fabricated cell and joined by weld means so that substantially

no space exists between adjacent cells, said cells being welded to their bottom ends to said base plate so that a strong compact modular structure is produced;

(f) the said walls of each of said fabricated cell enclosing its associated opening of said each of said fabricated cells so that said coolant can flow through said associated opening and through the fabricated cell with which it is associated;

(g) the walls of each four fabricated cells internally of the periphery of said array defining a four-sided additional cell and the opposite walls of consecutively arrayed fabricated cells along the periphery of said module defining two of the walls of additional cells, between corner cells, along the periphery of said array, third walls of each said additional cells along the periphery between the corner cells being defined by the outer walls of the row of fabricated cells directly inwardly of said consecutively arrayed cells and a fourth wall of each cell along the periphery between said corner cells extending as a section of the outer wall along the periphery of said array, and the corner cells being fabricated and each having a wall extending inwardly from the outer wall of said array in common with the adjacent additional cell along the periphery of said array, the other walls of each corner cell constituting sections of the outer wall of said array, said peripheral sections of the walls of the cells along said array being coextensive and constituting together the outer wall of the array;

(h) neutron-absorbing means on the external surface of the fabricated cell walls except on the coextensive sections of the outer wall around the periphery of said array; and

(i) leveling pads are mounted under the base plate near the periphery thereof and adjustably engage the pool floor and intermediate leveling pads are mounted under cells within said fuel-rack module, said intermediate pads being uniformly disposed.

4,960,561

NUCLEAR REACTOR LOWER INTERNALS

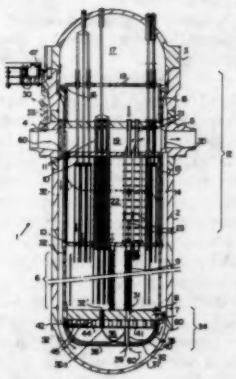
Chevereau Gérard, Le Raincy, and Michel Babin, Pantin, both of France, assignors to Framatome, Courbevoie, France

Filed Feb. 10, 1989, Ser. No. 308,499

Claims priority, application France, Feb. 11, 1988, 88 01646

Int. Cl.[5] G21C *17/20, 19/00*

U.S. Cl. 376—352 **7 Claims**



1. In a nuclear reactor comprising: a pressure vessel; a core in said vessel, formed of upstanding fuel assemblies carried by a lower support plate formed with passages for the upward flow of a coolant, and lower internals located under the core, said lower internals including:

a horizontal separation plate situated below the core support plate and at a distance thereof for defining a distribution chamber, secured to said core support plate by mechanical connection means mutually spaced apart at the periphery of the separation plate, said mechanical connection means defining passages for radial access of the coolant to the distribution chamber,

wall means situated under said separation plate and connected thereto to define a volume,

a plurality of coolant ducts each connecting an opening in said wall means to a hole through said separation plate for conveying coolant from the bottom of the pressure vessel to said distribution chamber across said volume,

a plurality of sleeves each secured to said separation plate and opening therethrough and each projecting upwardly through said distribution chamber into said core through a respective one of said passages in the lower support plate, and

a plurality of guide tubes entering said vessel in an upper part thereof, running down below said core support plate, each passing through said volume and each having an end portion connected to a respective one of said sleeves to define a guiding circuit therewith, said guide tubes being in direct contact with the coolant in said volume.

4,960,562

DISPERSION STRENGTHENED FERRITIC STEEL CLADDING TUBE FOR NUCLEAR REACTOR AND ITS PRODUCTION METHOD

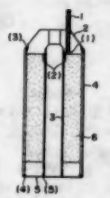
Takanari Okuda; Shigeo Nomura; Itaru Shibahara, all of Mito; Yoshinori Tateishi, Naka; Susumu Hirano, Amagasaki; Hiroshi Teranishi, Kobe; Masayuki Fujiwara, Kobe, and Toshio Nishida, Kobe, all of Japan, assignors to Doryokuro Kakunenryo Kaihatsu Jigyodan; Sumitomo Metal Industries, Ltd. and Kobe Steel, Ltd., all of Osaka, Japan

Filed Nov. 15, 1989, Ser. No. 436,785

Claims priority, application Japan, Nov. 19, 1988, 63-293202

Int. Cl.[5] G21C *3/00*

U.S. Cl. 376—416 **14 Claims**



1. A dispersion strengthened ferritic steel cladding tube for use in a nuclear reactor and having a double-layer structure, said cladding tube comprising a tube body made of a dispersion strengthened ferritic steel having a ceramic dispersed therein and containing 8 to 13% by weight of chromium, an inner surface of said tube body being lined with a ferritic steel containing 18 to 30% by weight of chromium.

4,960,563

HEAVY TUNGSTEN-NICKEL-IRON ALLOYS WITH VERY HIGH MECHANICAL CHARACTERISTICS

Guy Nicolas, Bonneville, France, assignor to Cime Bocuze, Courbevoie, France

Division of Ser. No. 253,506, Oct. 5, 1988, Pat. No. 4,938,799. This application Mar. 7, 1990, Ser. No. 489,510

Claims priority, application France, Oct. 23, 1987, 87 15315

Int. Cl.[5] B22F *3/24*

U.S. Cl. 419—23 **3 Claims**

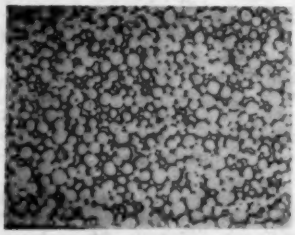
1. A process for the production of a heavy alloy containing

80 to 99% by weight tungsten, and nickel and iron in an Ni/Fe ratio greater than or equal to 2, comprising the steps of:

using powders of W, Ni and Fe of a FISHER diameter of between 1 and 15 μm,

mixing said powders in proportions corresponding to the composition of the desired alloy,

compressing said powders in the form of compacted items,



sintering the compacted items at a temperature of between 1490° and 1650° C. for from 2 to 5 hours,

treating the sintered compacted items under vacuum at between 1000° and 1300° C., and

subjecting the compacted items after treatment under vacuum to at least three cycles of operations, each cycle comprising a working step followed by a heat treatment.

4,960,564

PYROPHORIC ALLOY COMPLEXES

Raymond A. Sutula, Laurel, and Frederick E. Wang, Silver Spring, both of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 6, 1978, Ser. No. 899,058

Int. Cl.[5] C06B *43/00*

U.S. Cl. 420—400 **10 Claims**

1. A alloy of the formula $Li_xB_yM_z$ wherein M is sodium, and wherein $0.10 \leq x \leq 0.40$, $0.55 \leq y \leq 0.70$, $0.05 \leq z \leq 0.20$, and $x+y+z=1$ wherein x is the atomic fraction of lithium, y is the atomic fraction of boron, and z is the atomic fraction of sodium.

4,960,565

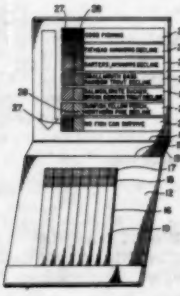
ACID MONITORING KIT

William S. Shurben, Kanata, Canada, assignor to Ecostix Environmental Inc., Ontario, Canada

Filed Mar. 14, 1989, Ser. No. 322,987

Int. Cl.[5] G01N *33/18*

U.S. Cl. 422—61 **15 Claims**



1. An acid monitoring kit comprising:

a base having;

(i) one discrete area provided with a plurality of discrete separable, bibulous, pH indicator strips, each strip being impregnated with at least one selected acid-base indicator, said acid-base indicator being visually recognizable as at least one unique color on each said bibulous pH indicator strip when said bibulous strip is dry, and as a different color upon being wetted with water, said different color being dependent on the pH of said water;

(ii) a second discrete area provided with a plurality of color comparison reference standards in a plurality of zones, each zone being of a unique color which corresponds to the color of said water-wetted, bibulous pH indicator strip, whereby comparison of the unique color of said pH indicator strip with the unique color of said reference standard provides an indication of the pH of said water; and

(iii) a third discrete area labelled to provide requisite information for the use of said acid monitoring kit, to correlate the unique color developed in said bibulous pH indicator strip to a unique color of said reference standard to provide an indication of the pH of the water.

4,960,566

CHEMICAL REACTION APPARATUS

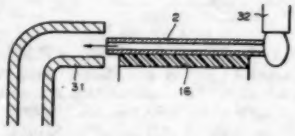
Ei Mochida, Tokyo, Japan, assignor to Mochida Pharmaceutical Co., Ltd., Tokyo, Japan

Filed Aug. 19, 1987, Ser. No. 87,646

Claims priority, application Japan, Sep. 11, 1986, 61-214521; Mar. 16, 1987, 62-39030[U]

Int. Cl.[5] G01N *35/04*

U.S. Cl. 422—65 **25 Claims**



1. A chemical reaction apparatus comprising:

a plurality of capillary tubes,

a conveying means for holding said capillary tubes substantially horizontally and for conveying said tubes along a conveyance path,

feeding means mounted along said conveyance path for feeding a liquid for use in a chemical reaction to the interior of said capillary tubes, said feeding means including at least one vertically disposed liquid specimen cylinder for containing a liquid specimen so that drops of said liquid specimen are suspended from a lower end thereof, said liquid specimen cylinder being mounted so that an end of each said capillary tube is sequentially disposed immediately adjacent said lower end as said capillary tubes are conveyed along said conveyance path so that said end of said capillary tube is brought into contact with a drop of liquid specimen suspended from said liquid cylinder whereby each capillary tube is filled with liquid specimen by capillary phenomena immediately upon contact of the drop with said end of each said tube;

washing means mounted along said conveyance path for washing said liquid from the interior of said tubes;

enzyme labeled antibody solution supplying means mounted along said conveyance path for feeding an enzyme labeled antibody solution to the interior of said capillary tubes; and

enzyme substrate solution supplying means mounted along said conveyance path for supplying an enzyme substrate solution to the interior of each of said capillary tubes.

4,960,567

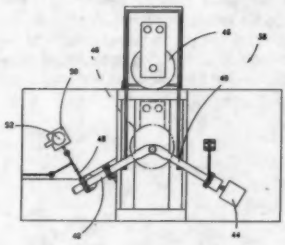
APPARATUS FOR ANALYZING FLUID INCLUSIONS

Michael P. Smith, Tulsa, Okla., assignor to Amoco Corporation, Chicago, Ill.

Continuation of Ser. No. 51,555, May 18, 1987, Pat. No. 4,898,831. This application Aug. 15, 1989, Ser. No. 394,350

Int. Cl.[5] G01N *7/00*

U.S. Cl. 422—83 5 Claims



1. Apparatus for deriving information relating to the geologic processes which form naturally-occurring mineral, said apparatus comprising:

manipulating means for receiving and for manipulating a sample comprising a cut polished section of sedimentary rock containing a plurality of microscopic fluid inclusions of less than 50 microns in diameter, the fluid inclusions being of interest in the exploration for oil and gas;

microscope means for examining the sample as it is manipulated for characterizing a class of said microscopic fluid inclusions of less than 50 microns in diameter which are formed in such sample and for identifying and selecting in the sample a single microscopic fluid inclusion within said characterized class;

means comprising a stylus having a point smaller than the selected single microscopic fluid inclusion and effective for mechanically rupturing in the sample essentially only the identified and selected microscopic fluid inclusion of less than 50 microns in diameter while the sample is received by the manipulating means;

means connected between the sample and the analysis means for passing gases released from said fluid inclusion to the analyzing means; and

means for analyzing gases passed from said fluid inclusion.

4,960,568

OXYGEN ANALYZER

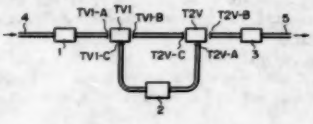
Yoshiro Matsumoto, Funabashi, and Akira Makihara, Ichikawa, both of Japan, assignors to Osaka Sanso Kogyo Ltd., Osaka, Japan

Filed Sep. 14, 1988, Ser. No. 244,206

Claims priority, application Japan, Oct. 2, 1987, 62-151482

Int. Cl.[5] G01N *31/00*

U.S. Cl. 422—83 3 Claims



1. An oxygen concentration analyzer comprising:

a gas flow passage having a gas inlet port at one end thereof for connecting a gas source to the gas flow passage in an atmospheric environment and a gas exhaust port at the opposite end for discharging a gas from the gas flow passage;

an oxygen concentration detector disposed in the gas flow passage in proximity to the gas exhaust port;

a portion of the gas flow passage between the gas inlet port and the oxygen concentration detector comprising first and second intermediate flow passages positioned to provide parallel intermediate flow paths for the gas to the oxygen concentration detector and connected to the gas inlet port via a branch-off point and connected to the oxygen concentration detector via a junction point;

a purifier disposed in the first intermediate flow passage for removing oxygen from the gas flowing therethrough;

first and second metal diaphragm type three-way valves, positioned at the branch-off point and junction point between the first and second intermediate flow passages and each of said first and second three-way valves respectively having a set of first, second, and third ports connected to the inlet port and the first and second intermediate flow passages and a set of fourth, fifth, and sixth ports connected to the oxygen concentration detector and the first and second intermediate flow passages;

the first and second three-way valves designed to be selectively switchable between two positioned in which in a first of the positions, the first, second, fourth, and fifth ports of each of the first and second three-way valves are opened to allow the gas to flow through the first intermediate flow passage and the sixth port of the second three-way valve is closed to prevent the flow of gas in the second intermediate flow passage, and in which in a second of the positions, the first, third, fourth, and sixth ports of each of the first and second three-way valves are opened so that gas may flow through the second intermediate flow passage and the second port of the first three-way valve is closed to prevent the flow of gas in the first intermediate flow passage;

whereby, when the first and second three-way valves are set in the first of the positions and gas flows through the purifier before introduction into the oxygen concentration detector to calibrate the oxygen concentration detector and the second intermediate flow passage is blocked off at the junction point to prevent the contamination of the gas after the removal of oxygen therefrom with the gas in the second intermediate flow passage and when the first and second three-way valves are set in the second of the positions, the gas flows directly into the oxygen concentration detector to detect the oxygen content thereof and the first intermediate flow passage is blocked at the branch-off point to alternately allow the gas source to be connected to the inlet port without air entering the second intermediate flow passage and eventually contaminating the gas passing through the purifier and used in calibrating the oxygen concentration detector.

4,960,569

CORONA DISCHARGE OZONATOR WITH COOLED FLOW PATH

Richard C. Fovell, San Jose; Jan M. Heinemann, San Luis Obispo, and Klaus W. Heinemann, Sunnyvale, all of Calif., assignors to Altes Corporation, Palo Alto, Calif.

Filed Nov. 14, 1988, Ser. No. 271,030

Int. Cl.[5] B01J *19/08*

U.S. Cl. 422—186.19 10 Claims

1. A corona discharge ozonator comprising:

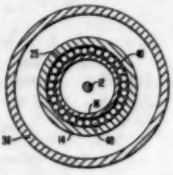
a first electrode;

a second electrode concentric to and spaced from the first electrode, the first and second electrodes connectable to an electrical power source for operation of the ozonator;

a dielectric material disposed between the electrodes, wherein a) the dielectric material and the first electrode or b) the dielectric material and the second electrode becoming hotter than the other during operation;

an ozonization chamber formed between one of the elec-

trodes and the dielectric material and defining a fluid flow path; and,



means for transferring heat from the hotter to the cooler of the dielectric and the first or second electrode, the heat transfer means disposed within the ozonization chamber.

4,960,570

OZONE GENERATOR

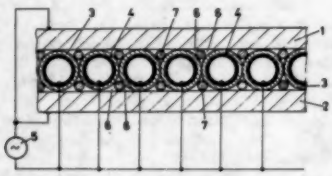
Günter Mechtersheimer, Nussbaumen, Switzerland, assignor to Asea Brown Boveri Ltd, Baden, Switzerland

Filed Aug. 25, 1989, Ser. No. 398,400

Claims priority, application Switzerland, Sep. 9, 1988, 3383/88

Int. Cl.[5] B01J *19/08*

U.S. Cl. 422—186.21 **12 Claims**



1. Ozone generator comprising:

a pair of metal planar plates serving as outer electrodes separated from one another;

a tube having an outer dielectric layer with an outer dimension corresponding to the separation between said plates and an inner electrically conductive material serving as an inner electrode;

said tube and said planar plates defining an inhomogeneous discharge gap between a portion of said tube and said planar plates not in contact with each other; and

an alternating current source connected to said inner and outer electrodes for applying a voltage across said inner and outer electrodes and thereby producing an electrical discharge in said inhomogeneous discharge gap to produce ozone.

4,960,571

QUENCH ASSEMBLY DESIGN

Phiroz M. Bhagat; Robert M. Koros, both of Westfield; Rutton D. Patel, Berkeley Heights; Jose M. Peruyero, Morris Plains, and John T. Wyatt, Florham Park, all of N.J., assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Filed Dec. 14, 1988, Ser. No. 284,050

Int. Cl.[5] B01J *10/00, 8/04*

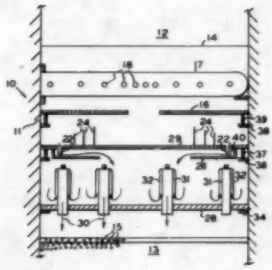
U.S. Cl. 422—194 **8 Claims**

1. A quench assembly having improved mixing efficiency comprising:

a quench fluid inlet zone adapted to receive fluids from a catalyst bed and including means for introducing a quench fluid into said quench fluid inlet zone;

a quench mixing zone communicating with said quench fluid inlet zone by means of a central opening in a first quench mixing zone plate therebetween, said quench mixing zone having a second plate below said first plate, said second plate having a central portion and an annular portion and a plurality of openings in the annular portion, whereby fluid entering into said quench mixing zone is deflected by said second plate and moves outwardly and radially before exiting via said plurality of openings;

baffle means located on said second plate between the center of said second plate and the openings in the annular portion, the baffle means being arranged at a predetermined tangential angle and in concentric rings wherein the baffle means in one concentric ring are positioned with respect to the baffles in the next adjacent concentric ring whereby



fluids impinging on baffles in one concentric ring will result in current eddies that will be directed so as to impinge on the baffles in the next adjacent concentric ring;

a jet stirred mixing zone;

a plurality of pipes extending downwardly from said second plate of said quench mixing zone communicating with the openings therein, said pipes having slots therein oriented at a predetermined angle so as to introduce fluid exiting from said quench mixing zone into said jet stirred mixing zone in a swirling direction;

a central opening at the bottom of said jet stirred mixing zone;

a distributor zone communicating with said opening in said jet stirred mixing zone.

4,960,572

METHOD AND APPARATUS FOR CRYSTALLIZING SUBSTANCES DISSOLVED IN A LIQUID AT ZERO-GRAVITY

Walter Littke, Schallstadt, and Erhard Schoen, Vagen, both of Fed. Rep. of Germany, assignors to Messerschmitt-Bölkow-Blohm GmbH, Munich, Fed. Rep. of Germany

Continuation of Ser. No. 47,878, May 6, 1987, abandoned. This application Sep. 19, 1988, Ser. No. 248,234

Claims priority, application Fed. Rep. of Germany, May 7, 1986, 3615541

Int. Cl.[5] C30B *7/08*

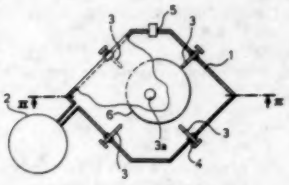
U.S. Cl. 422—245 **10 Claims**

1. An apparatus for cyrstallizing a substance which is dissolved in a liquid, the apparatus functioning in zero-gravity and comprising:

container means enclosing a three-dimensional space of preset dimensions within which space the liquid forms a quasi-freely suspended liquid sphere having a diameter; and

retaining means at least one of disposed on inner walls of the container means and inserted through the walls of the container means into the three-dimensional space, the retaining means limiting the space for holding the suspended liquid sphere from outside the space in a quasi-freely suspended state by momentary and intermittent

contact with the sphere, whereby the sphere is held non-rigidly within the space by the retaining means, the retaining means being at least one of quasi-punctiform and quasi-linear, the retaining means thereby preventing the



sphere from contacting the inner walls of the container means, the maximum distance between innermost parts of any two adjacent retaining means being smaller than the diameter of the liquid sphere.

4,960,573

RECOVERING METHOD OF CATALYTIC COMPONENT AND CARRIER FROM WASTE CATALYST

Takeshi Okutani; Yoshinori Nakata; Masaaki Suzuki, all of 17-2-1 c/o Agency of Industrial Science and Tecnology, Government Industrial Development Laboratory, Tsukisamu-Higashi 2-jyo, Toyohira-ku, Sapporo-shi, Hokkaido, and Takeo Akiyama, 771, Kozono, Ayase-shi, Kanagawa-ken, all of Japan

Filed Jan. 5, 1989, Ser. No. 293,897

Claims priority, application Japan, Jan. 22, 1988, 63-12296

Int. Cl.[5] C01G *55/00;* **C22B** *11/06;* **C01B** *33/08;* **B01J** *27/224*

U.S. Cl. 423—22 **6 Claims**

1. A method of recovering a catalytic substance comprising at least one noble metal and a carrier from a waste catalyst composed of a catalyst prepared by supporting a catalytic substance on a carrier composed of porous silicon carbide which comprises the steps of:

adding a potassium salt selected from the group consisting of potassium chloride (KCl), potassium hydrogen sulfide ($KHSO_4$), potassium sulfate (K_2SO_4) and potassium nitrate (KNO_3) to the waste catalyst in an amount of 0.1 to 2% by weight based on the weight of the waste catalyst,

subjecting the mixture to a chlorinating treatment at a temperature of about 600° to 1000° C. and then

recovering the catalytic substance and the carrier in the form of chlorides.

4,960,574

PALLADIUM CONTAINING CATALYST FOR TREATMENT OF AUTOMOTIVE EXHAUST

Maureen L. Bricker, Buffalo Grove, Ill., assignor to Allied-Signal Inc., Morris Township, Morris County, N.J.

Division of Ser. No. 197,728, May 23, 1988, Pat. No. 4,868,149. This application Jul. 25, 1989, Ser. No. 384,344

Int. Cl.[5] B01D *53/36*

U.S. Cl. 423—213.5 **7 Claims**

1. A method of treating an automotive exhaust comprising contacting the exhaust with a catalyst comprising a metallic or ceramic honeycomb carrier having deposited thereon a layer of an alumina with a surface area from about 75 to about 200 m^2/g, the alumina having dispersed thereon lanthanum oxide present as crystallites of less than about 25 Angstroms, cerium oxide, the cerium oxide characterized in that at least 3% of the cerium in the cerium oxide crystal lattice is replaced by lanthanum, palladium oxide in the form of crystallites less than about 25 Angstroms in size and rhodium oxide.

4,960,575

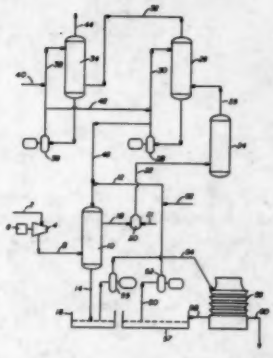
REMOVAL OF HYDROGEN SULFIDE WITH ON SITE GENERATED SULFITE FROM GEOTHERMAL STEAM

Stephen A. Bedell, and Larry H. Kirby, both of Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jun. 1, 1989, Ser. No. 359,533

Int. Cl.[5] C01B *17/16, 31/20, 17/00, 17/64*

U.S. Cl. 423—222 **13 Claims**



1. A continuous process for abating hydrogen sulfide in geothermal steam, comprising the steps of:

condensing the geothermal steam with an aqueous solution of sulfites, essentially free of peroxide and polyvalent metal chelate, and containing a cationic polymeric catalyst to convert up to about one-third of the hydrogen sulfide to soluble thiosulfate and to obtain a non-condensable gas stream of reduced hydrogen sulfide content containing at least about two-thirds of the hydrogen sulfide;

incinerating the non-condensable gas stream to substantially convert said hydrogen sulfide to sulfur dioxide;

selectively absorbing the sulfur dioxide from said incinerated non-condensable gas stream in an aqueous alkaline solution to form sulfites for said condensation step, said absorption being at conditions effective to substantially avoid carbon dioxide absorption and formation of insoluble carbonates; and

supplying said sulfites from said absorption step to said condensation step.

4,960,576

H_2S ABATEMENT IN GEOTHERMAL STEAM DURING STACKING OPERATIONS

Stephen A. Bedell; Charles A. Hammond, and Larry H. Kirby, all of Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jun. 1, 1989, Ser. No. 359,896

Int. Cl.[5] C01B *17/16, 31/20, 17/02*

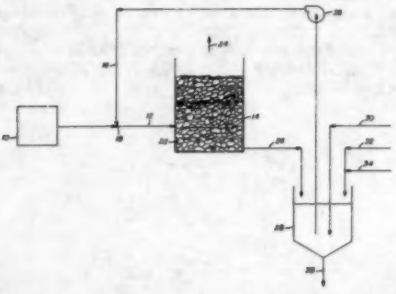
U.S. Cl. 423—226 **17 Claims**

1. A method of abating hydrogen sulfide in stacked geothermal steam consisting essentially of the steps of:

injecting ferric chelating solution into a geothermal steam stacking line vented through a rock muffler directly to the atmosphere, sufficiently upstream from said rock muffler wherein the steam and injected chelating solution have a contact time of 0.2–1.0 seconds, and in an amount effective to abate hydrogen sulfide in said geothermal steam vented therethrough, whereby the hydrogen sulfide therein is substantially converted to elemental sulfur and the ferric chelate is reduced to ferrous chelate;

collecting said chelating solution and said sulfur in a basin in said rock muffler;

withdrawing said chelating solution from said basin;



separating said sulfur from said chelating solution; and

oxidizing said chelating solution to regenerate said ferrous chelate to ferric chelate for reuse in said injection step.

4,960,577

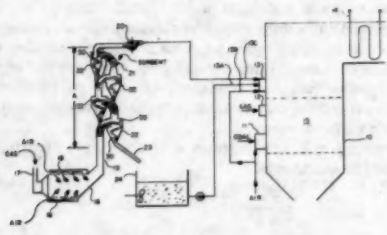
ENHANCED SORBENT INJECTION COMBINED WITH NATURAL GAS REBURNING FOR A SOX CONTROL FOR COAL FIRED BOILERS

Tsvetan I. Torbov, San Jose, and Howard B. Mason, Los Altos, both of Calif., assignors to Acurex Corporation, Mountain View, Calif.

Filed Feb. 4, 1988, Ser. No. 152,073

Int. Cl.[5] B01J *8/00*; C01B *17/00*; F23B *7/00*; F23J *11/00*

U.S. Cl. 423—242 **6 Claims**



1. In a process for reducing gaseous SO_X content of exhaust gases from a combustion installation, by injecting an aqueous dispersion of a particulate sorbent into said combustion installation in a zone outside of the combustion region such that said aqueous dispersion is initially exposed to a temperature exceeding about 2200° F.; the improvement comprising, prior to said step of injecting said aqueous dispersion into said combustion installation, the steps of

(a) mixing substantially dry solid particulates with combustion gases from the combustion of hydrocarbon gas at a temperature in the range of about 1800°–1900° F. for 1.5–2.0 seconds to form a calcined solid sorbent capable of reacting with sulfur-containing gases; and

(b) mixing said calcined solid sorbent to form an aqueous dispersion for injection into said combustion installation; wherein said solid particulates comprise calcium carbonate, calcium hydroxide, magnesium carbonate, magnesium hydroxide or mixtures of any two or more thereof.

4,960,578

ZEOLITE ECR-10

David E. W. Vaughan, Flemington, and Karl G. Strohmaier, Port Murray, both of N.J., assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Continuation-in-part of Ser. No. 122,782, Nov. 19, 1987, abandoned. This application Oct. 28, 1988, Ser. No. 264,221

Int. Cl.[5] C01B *33/24*

U.S. Cl. 423—326 **12 Claims**

1. A zeolite composition comprising in terms of mole ratio of oxides:

$$(Na,Cs)_2O:(Al,Ga)_2O_3:2 \text{ to } 4\ SiO_2:xH_2O$$

wherein x=0 to 6, the Ga/Al ratio is greater than four, and having the essential x-ray diffraction pattern lines given in Table 1 below:

TABLE 1

D(A)	Peak Intensity	20
10.5	S	8.41
3.50	S	25.45
3.32	VS	26.86
3.16	S	28.19
3.03	S	29.47
2.71	M	33.04

where the peak intensity designations are VS=100–70; S=70–40; and M=40–20.

4,960,579

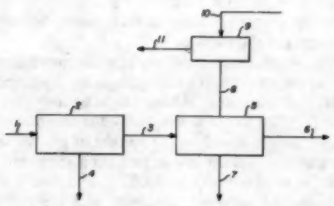
MEMBRANE PROCESS AND SYSTEM FOR NITROGEN PRODUCTION

Michael J. Campbell, Clarence Center, N.Y., assignor to Union Carbide Corporation, Danbury, Conn.

Filed Apr. 1, 1988, Ser. No. 176,658

Int. Cl.[5] B01J *8/02*; C01B *21/00*

U.S. Cl. 423—351 **22 Claims**



1. An on-site system for the production of high purity nitrogen gas from air comprising:

(a) a first membrane or pressure swing adsorption separation system capable of separating air into a partially purified nitrogen stream containing residual oxygen and an oxygen rich discharge stream;

(b) means for supplying feed air to said first membrane or pressure swing adsorption separation system for separation therein;

(c) a second membrane, pressure swing adsorption or cryogenic separation system capable of separating relatively pure hydrogen from an impure hydrogen stream containing a relatively high level of impurities, so as to produce a purified hydrogen stream having a desirably low level of said impurities;

(d) means for supplying impure hydrogen feed gas available on-site to said second membrane, pressure swing adsorption or cryogenic separation system for purification therein;

(e) a catalytic combustion system adapted for the reaction of

said purified hydrogen stream with residual oxygen present in the partially purified nitrogen stream;

(f) means for passing the partially purified nitrogen and purified hydrogen from said first and second separation systems to said catalytic combustion system; and

(g) means for recovering a high purity nitrogen gas stream from said catalytic combustion system, said high purity nitrogen having a desirably low residual oxygen content,

whereby high purity nitrogen can advantageously be produced on-site by the convenient purification of low cost, impure hydrogen available on-site and the economical use thereof in the final purification of the partially purified nitrogen stream.

10. A process for the on site production of high purity nitrogen gas from air comprising:

(a) passing feed air to a first membrane or pressure swing adsorption separation system for separation therein;

(b) withdrawing a partially purified nitrogen stream containing residual oxygen and an oxygen rich discharge stream from said first separation system;

(c) passing impure hydrogen available on-site to a second membrane, pressure swing adsorption or cryogenic separation system for purification therein;

(d) reacting said purified hydrogen with residual oxygen present in said partially purified nitrogen stream in a catalytic combustion system;

(e) recovering a high purity nitrogen gas stream from said catalytic combustion system, said high purity nitrogen having a desirably low residual oxygen content,

whereby high purity nitrogen can advantageously be produced on-site by the convenient purification of low cost, impure hydrogen available on-site and the economical use thereof in the final purification of the partially purified nitrogen.

4,960,580

PROCESS FOR PURIFYING HYDROGEN FLUORIDE

William H. Gumprecht, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Oct. 31, 1989, Ser. No. 429,507

Int. Cl.[5] C01B *7/19*

U.S. Cl. 423—484 **13 Claims**

1. A process for purifying hydrogen fluoride comprising the steps of:

(a) contacting anhydrous hydrogen fluoride containing arsenic impurities with an effective amount of a sulfur compound capable of providing sulfide ions to precipitate arsenic sulfide, and

(b) recovering purified anhydrous hydrogen fluoride having reduced amounts of arsenic impurities.

4,960,581

METHOD FOR PREPARING GASEOUS METALLIC FLUORIDE

Isao Harada; Yukihiro Yoda, both of Yamaguchi; Naruyuki Iwanaga, Shimonoseki; Toshihiko Nishitsuji, Shimonoseki, and Akio Kikkawa, Shimonoseki, all of Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan

Filed Mar. 13, 1989, Ser. No. 322,415

Claims priority, application Japan, Mar. 16, 1988, 63-60271; Mar. 16, 1988, 63-60272; Mar. 16, 1988, 63-60273; Mar. 16, 1988, 63-60274; Nov. 11, 1988, 63-283749

Int. Cl.[5] C01B *9/08*

U.S. Cl. 423—489 **18 Claims**

1. A method for preparing a gaseous metallic fluoride by reacting a metal or its oxide wit fluorine gas or nitrogen trifluoride gas, the process comprising the steps of mixing said metal or its oxide with a molding auxiliary compound comprising at least one compound selected from the group consisting of lithium fluoride, sodium fluoride, potassium fluoride, rubidium fluoride, cesium fluoride, beryllium fluoride, magnesium fluoride, calcium fluoride, strontium fluoride, barium fluoride, aluminum fluoride, gallium fluoride, indium fluoride and aluminum sodium fluoride; molding the resulting mixture under pressure to form molded pieces; and contacting the molded pieces with said fluorine gas or nitrogen trifluoride gas while said molded pieces are heated to form said gaseous metallic fluoride.

4,960,582

PROCESS FOR PRODUCING MICROCRYSTALLINE CO/TI-SUBSTITUTED BARIUM FERRITE PLATELETS

Susumu Iwasaki; Shigefumi Kamisaka; Iwao Yamazaki, and Tutomu Hatanaka, all of Osaka, Japan, assignors to Sakai Chemical Industry Co., Ltd., Osaka, Japan

Filed Aug. 1, 1989, Ser. No. 387,965

Claims priority, application Japan, Aug. 4, 1988, 63-195888

Int. Cl.[5] C01G *49/06*

U.S. Cl. 423—632 **6 Claims**

1. A process of producing a spinel structure Ni/Zn ferrite-modified, Co/Ti-substituted microcrystalline barium ferrite platelets having an average particle size of 0.03–0.15 μm, a temperature coefficient of coercive force of not more than +1 Oe/°C., including small absolute values in negative region, and a saturated magnetization of not less than 56 emu/g, which comprises:

(a) a first step of adding an alkali to an aqueous solution which contains Ba ions, Fe(III) ions, Co ions and Ti ions in a molar ratio in conformity with the general formula of:

$$BaO.n(Fe_{12-2x}Co_xTi_xO_{18})$$

wherein n is a numeral of 0.8–1.0 and x is a numeral of 0.5–1.0, thereby to form coprecipitates therof, and then heating the dispersion of the coprecipitates at a pH of not less than 12 at temperature of not less than 60° C. under normal pressure, thereby to provide substantially amorphous precursors of Co/Ti-substituted barium ferrites;

(b) a second step of adding an aqueous solution of nickel salts in amounts of one to four times in moles the amount of the Ba ions, to the dispersion of the precursors of Co/Ti-substituted barium ferrites, and subjecting the slurry to hydrothermal reaction at temperature of 150°–300° C., thereby to provide precursors of spinel structure nickel ferrite-modified, Co/Ti-substituted barium ferrites which have dual phases of magnetoplumbite structure barium ferrites and spinel structure nickel ferrites;

(c) a third step of depositing a water insoluble zinc compound in amounts of 0.2 to 1.0 times in moles the amount of the Ba ions on the precursors of the dual phase barium ferrites; and

(d) a fourth step of calcining the precursors of barium ferrites having the water insoluble zinc compounds deposited thereon in the presence of barium chloride at temperatures of 800°–950° C., and then washing the calcined products to remove therefrom the barium chloride.

4,960,583

GAMMA-FE_2O_3/FE_3O_4 SPINELS

Abel Rousset, Ramonville Saint-Agne; Belaid Maschi, Segangan-Nador Maroc; Bernard Gilot, and Michel Gougeon, both of Toulouse, all of France, assignors to Atochem, Puteaux, France

Filed Dec. 16, 1988, Ser. No. 285,422

Claims priority, application France, Dec. 16, 1987, 87 17575

Int. Cl.[5] C01G *49/02*

U.S. Cl. 423—633 **22 Claims**

1. A composition of matter based on an oxide having the lacunar spinel structure, having a specific surface area greater than 2 m^2/g and comprising:

(a) at least one oxide of lacunar spinel structure of the γ-Fe_2O_3 type and having the formula:

$$\left[\left(\begin{matrix}Fe^{3+}_{1-x} & M^{3+}_{x}\end{matrix}\right)_{8-t}\square_{1-2t}Q^{+}_{3t}\right]O^{2-}_{12}$$

in which M is a trivalent metal or any mixture of trivalent metals, Q is a monovalent metal or any mixture of monovalent metals, x ranges from 0 to $\frac{1}{3}$, t ranges from 0 to 0.5, and

$\square$

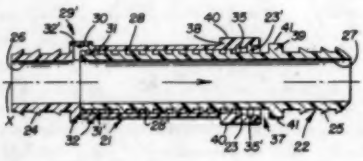
represents a vacancy in the spinel structure.

4,960,584

ADJUSTABLE EMITTER FOR HEAP LEACH MINING PERCOLATION SYSTEM AND METHOD

Sidney L. Brown, Atlanta, Ga., assignor to Wade Manufacturing Co., Portland, Oreg.

Filed Oct. 24, 1988, Ser. No. 261,919
Int. Cl.[5] C22B *3/02, 3/04*
U.S. Cl. 423—658.5 **30 Claims**



1. A controlled percolation system for heap leach mining over an ore bed composed of crushed metal laden ore deposited on an impervious pad comprising

supply means for conducting a leaching solution adjacent to said ore bed,

a plurality of spaced tube means connected to said supply means for receiving said leaching solution therefrom; and

a plurality of in-line emitter means each having an inlet and an outlet connected to said tube means and positioned in spaced relationship along each of said tube means for directly emitting said leaching solution into said ore bed at a controlled and substantially uniform rate, at least some of said emitter means including at least first and second restricted passage means and adjustment means for selectively connecting said inlet directly to either said first or said second restricted passage means whereby said leaching solution will either flow from said inlet through said first restricted passage means and of out said outlet, or from said inlet, through said second restricted passage means and out of said outlet.

4,960,585

RAPID HAIR PH INDICATION AND SOLUTION THEREFOR

Nasser N. Tehrani, 9 Drum Hill La., Stamford, Conn. 06902

Continuation-in-part of Ser. No. 317,774, Mar. 2, 1989, abandoned. This application Feb. 7, 1990, Ser. No. 476,331
Int. Cl.[5] A61K *7/06, 9/20*
U.S. Cl. 424—7.1 **36 Claims**

1. A method for the determination of the pH of a hair sample to determine if the hair pH is within the hair isoionic range of about pH 6 to 7 comprising contacting the hair sample with a pH indicator solution for a period of time sufficient for the indicator solution to change to a color indicative of the hair being within one of three pH ranges, said solution changing to a first color when the hair pH is within the hair isoionic range of about pH 6 to 7, to a second and different color when the hair pH is acidic and below about pH 6 and to a third color different from the first and second colors when the hair pH is alkaline above about pH 7.

4,960,586

AQUEOUS STANNOUS FLUORIDE NON-ABRASIVE HOME TREATMENT GEL COMPOSITIONS

Christopher H. Suhonen, San Jose, Calif., assignor to Gillette Canada Inc., Montreal, Canada

Filed Nov. 15, 1989, Ser. No. 437,467
Int. Cl.[5] A61K *7/18, 33/16*
U.S. Cl. 424—52 **3 Claims**

1. In a method for formulating an aqueous non-abrasive home treatment gel consisting essentially of water-unstable stannous fluoride, the improvement comprising the step of dispersing the stannous fluoride in an aqueous solution of an alkyl vinyl ether and maleic anhydride or maleic acid copolymer as the essential stannous ion chelate forming stabilizer, the amount of said copolymer being sufficient to stabilize the stannous fluoride concentration during formulation against stannous oxide precipitation by providing oxidation protection to the stannous ion.

4,960,587

METHOD AND APPARATUS FOR APPLICATION OF FINGER & TOENAIL COATINGS

Joie Rucker, P.O. Box 215, Sausalito, Calif. 94965

Filed Mar. 10, 1988, Ser. No. 166,395
Int. Cl.[5] B05L *17/06;* B05D *1/32*
U.S. Cl. 424—61 **1 Claim**

1. A method of appiying a coating to a finger or toenail comprising:

obtaining a mask comprising a flat U-shaped sheet of pliable, elastic and manually stretchable and formable material having an adhesive coated on one surface thereof for releasably adhering said mask to a cuticle and surrounding skin tissue and said mask including flat, elastic, manually stretchable and formable opposing side means and base means between said side means for covering, sealing and protecting said cuticle and skin tissue and bounding a cut out open to a forward edge of said sheet and having a size and shape approximating the size and shape of said nail to expose said nail for coating while said elastic and stretchable side and base means are manually stretched and formed to cover said cuticle and skin tissue with a inner marginal edge exactly fitting a border of said nail,

exposing said adhesive coating on said mask,

adhering said mask to said cuticle and skin tissue bounding said nail to be coated with said marginal edge exactly fitting said border of said nail to expose the surface area of said nail to be coated and to protect said cuticle and skin tissue from exposure to coating material by

(i) placing said mask on and over said cuticle and skin tissue around said nail with said flat, elastic and stretchable side and base means overlying said cuticle and skin tissue,

(ii) manually stretching and forming said flat, elastic and stretchable side and base means until said marginal edge defined by said side and base means exactly fits said border of said nail, and

(iii) firmly pressing said mask with side and base means against said cuticle and skin tissue to secure said mask to said skin tissue,

coating said nail with a coating material while said mask is adhered in place,

permitting said coating material to set by drying, and

removing said mask leaving the surface of said nail precisely coated with said coating material.

4,960,588

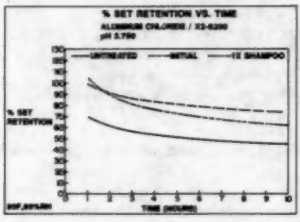
HAIR TREATMENT COMPOSITIONS TO IMPART DURABLE HAIR SET RETENTION PROPERTIES

Myra A. Hoshowski, Addison, and Eugene Zeffren, Lincolnshire, both of Ill., assignors to Helene Curtis, Inc., Chicago, Ill.

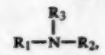
Filed Nov. 16, 1988, Ser. No. 272,060

Int. Cl.[5] A61K *7/075, 7/11*

U.S. Cl. 424—71 **75 Claims**



1. A hair setting composition comprising an effective amount of a water-insoluble amino-containing compound having a water solubility of 0.5 g or less per 100 milliliters of water, wherein the water-insoluble amino-containing compound is a primary amine or a secondary amine having the structure



wherein when the amino-containing compound is a primary amine, R_1 is an alkyl group or substituted alkyl group of between five and about 20 carbon atoms in length, and R_2 and R_3 are hydrogen atoms, and when the amino-containing compound is a secondary amine, R_1 and R_2 are alkyl groups or substituted alkyl groups of about 20 or less carbon atoms in length and wherein either R_1 or R_2 is at least five carbon atoms in length, and R_3 is a hydrogen atom; an effective amount of an ionizable metal salt, wherein the metal of the ionizable metal salt has a valence of at least II; and a suitable carrier; wherein the composition has a pH of from about 2.7 to about 4.5 and the ionizable metal salt and water-insoluble amino-containing compound are present in the composition in a molar or molar-equivalent ratio of at least 1:1.

4,960,589

METHOD OF ENHANCING GROWTH AND IMPROVING FEED CONVERSION RATIO IN ANIMALS AND BLOCK FOR USE THEREIN

Tutomu Sasagawa, Shizuoka, Japan, assignor to Toyo Jozo Kabushiki Kaisha, Shizuoka, Japan

Division of Ser. No. 22,203, Mar. 5, 1987, Pat. No. 4,869,907, Continuation-in-part of Ser. No. 725,134, Apr. 18, 1985, abandoned. This application Jan. 9, 1989, Ser. No. 294,808

Claims priority, application Japan, Apr. 18, 1984, 59-76446

Int. Cl.[5] A61K *9/00, 31/70*

U.S. Cl. 424—442 **1 Claim**

1. A method of enhancing the growth of domestic animals and improving the feed conversion ratio of feed provided to said domestic animals wherein said domestic animals are selected from the group consisting of cattle and poultry, comprising causing said domestic animals, whereby growth of said domestic animals and the feed conversion ratio of feed provided to said domestic animals are both enhanced to consume as a supplemental foodstuff by licking, a sugar block consisting essentially of glucose and having a hardness such that said block does not easily crumble, said block having a compressive strength in the range of 50 to 150 kg/cm^2 and a water content of 0.2 to 15% by weight, said block having a weight of at least 500 g, each dimension of said block being greater than 2 cm, and said block being suspended at a height above ground level accessible to licking by said animals, said block being formed in the shape of a doughnut having a hole of a size sufficient to accommodate the nose of one of said animals.

4,960,590

NOVEL POLYMERIC QUATERNARY AMMONIUM TRIHALIDES

C. George Hollis, and S. Rao Rayudu, both of Germantown, Tenn., assignors to Buckman Laboratories International, Inc., Memphis, Tenn.

Filed Feb. 10, 1989, Ser. No. 308,677

Int. Cl.[5] H61K *31/74;* **A01N** *25/00, 33/12;* **C08G** *73/00*

U.S. Cl. 424—78 **9 Claims**

1. A polymeric quaternary ammonium compound of the formula:

wherein

X_1, X_2 and X_3 are each a halogen and can all be the same halogen or different halogens;

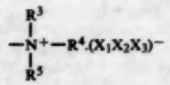
R^1 and R^2, which can all be the same or different, are selected from the group consisting of alkyl groups having from 1 to 20 carbon atoms and having either 0 or 1 hydroxyl substituent, a benzyl group, and a benzyl group bearing on the benzene moiety one alkyl group having from 2 to 20 carbon atoms;

A is selected from the group consisting of a divalent hydrocarbon radical containing 1 to 10 carbon atoms and a divalent hydrocarbon radical containing 1 to 10 carbon atoms and also containing an oxygen atom as an either group; wherein A may be identical with or different from B, wherein B is defined as follows;

B is a divalent hydrocarbon radical containing 1 to 10 carbon atoms, said divalent hydrocarbon radical being substituted by at least one substituent selected from the group consisting of a hydroxyl group and a substituent substituted by at least one hydroxyl group; and

n is a whole number from 2 to 30, with the proviso that, when A and B are identical, n is a whole number from 1 to 15;

and wherein said polymer may be capped on one or both ends with a quaternary ammonium group of the formula:



wherein

X_1, X_2 and X_3 are as defined above; and

R^3, R^4 and R^5, which can all be the same or different, are alkyl groups having from 1 to 20 carbon atoms and having either 0 or 1 hydroxyl substituent, or R^3 and R^4 taken together with the nitrogen atom to which they are attached may form a saturated heterocyclic ring having from 5 to 7 ring atoms.

4,960,591

METHODS AND COMPOSITIONS FOR RELIEF OF STOMACH DISTRESS

Henry G. Gribou, 3565 S. Oakdale Dr., New Berlin, Wis. 53151

Filed Apr. 17, 1989, Ser. No. 338,942
Int. Cl.[5] A61K *37/00, 33/00*
U.S. Cl. 424—93 12 Claims

1. A method for relief of stomach distress, comprising ingestion of a composition comprising non-fat dry milk, yeast and sodium bicarbonate.

4,960,592

LANOLIN AND LANOLIN OIL SKIN TREATMENT COMPOSITION

Resheda Hagen, Oak Ridge, Tenn., and Gabriel Barnett, New York, N.Y., assignors to Lanocare Laboratories, Oak Ridge, Tenn.

Filed Apr. 17, 1989, Ser. No. 338,673
Int. Cl.[5] A61K *35/36, 7/48*
U.S. Cl. 424—537 12 Claims

1. An anhydrous skin treatment composition consisting essentially of:

(A) from about 10 to about 90% by weight of lanolin; and

(B) from about 90 to about 10% by weight of lanolin oil.

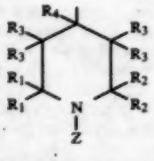
4,960,593

PROCESS FOR PREPARING THERMALLY STABLE OLEFINIC POLYMERS

Franco Sevini, Bologna, and Luciano Noristi, Ferrara, both of Italy, assignors to Himont Incorporated, Wilmington, Del.

Continuation-in-part of Ser. No. 115,657, Oct. 27, 1987, abandoned, which is a continuation of Ser. No. 826,260, Feb. 2, 1986, abandoned. This application Mar. 31, 1989, Ser. No. 331,702
Int. Cl.[5] C08K *5/34*
U.S. Cl. 524—99 22 Claims

1. A process for the manufacture of thermally stable, alpha-olefin polymers, which polymers are obtained by means of catalysts prepared by reaction of an aluminum alkyl compound with a solid component selected from a product comprising a titanium compound and a magnesium dihalide in active form, and a product comprising a tetravalent titanium compound supported onto a trivalent titanium halide having a surface area greater than 50 m^2/g, which process consists in adding before or during polymerization or after polymerization is substantially complete, but before quenching the catalyst, a stabilizer containing in the molecule one or more substituted piperidyl groups having the following general formula:



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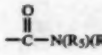
wherein R1 are the same or different from each other and are C_1–C_4 alkyl radicals, tetramethylpiperidyl radicals, or the alkyl radicals, together with the piperidyl carbon atom to which they are bonded, form a C_5–C_9 cycloalkyl radical; R_2 are the same or different from each other and are hydrogen, C_1–C_{18} alkyl radicals, C_7–C_{18} aralkyl radicals, or said alkyl radicals together with the piperidyl carbon atom to which they are bonded, are a C_5–C_{10} cycloalkyl radical; R_3 are the same or different from each other and are hydrogen, C_1–C_{18} alkyl radicals or C_7–C_{18} aralkyl radicals; R_4 is hydrogen, a C_1–C_8 alkyl radical or a benzyl radical; Z is hydrogen or C_1–C_{18} alkyl; C_1–C_{12} alkylene; C_3–C_{12} alkenyl; C_3–C_5 alkynyl; C_7–C_{18} aralkyl; C_2–C_4 acyl; C_2–C_{18} alkanoyl; C_3–C_{18} alkoxyalkyl; C_3–C_{18} alkenoyl; oxyl; cyanomethyl, and xylylenyl radicals; a radical having valence from 1 to 4 and containing from 1 to 4 hydroxyl groups and, optionally, containing ether, ester, or heterocyclic groups, all the valences of this radical being bonded to the nitrogen of the piperidyl rings; a bivalent radical containing one or more ester or amide groups, and a radical



wherein R_5 and R_6 are hydrocarbyl radicals.

4,960,594

POLYURETHANE FOAM DRESSING

Travis W. Honeycutt, Irvine, Calif., assignor to Derma-Lock Medical Corporation, Norcross, Ga.

Filed Sep. 22, 1988, Ser. No. 247,871
Int. Cl.[5] A61L *15/00*
U.S. Cl. 424—445 16 Claims

1. A wound dressing material consisting essentially of a nonadherent, thin film, foam polyurethane membrane having a substantially smooth surface for application to a wounded area and an insulating region adjacent said smooth surface for maintaining the wound near body temperature, wherein said wound dressing is formed in the presence of a substantial amount of water to enhance CO_2 formation and exhibits a moisture vapor transmission rate greater than 0.30 grams/$inch^2$/ day.

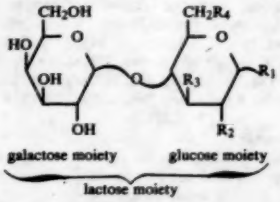
4,960,595

LIPID MEMBRANE STRUCTURES

Sadao Hirota; Hiroshi Kikuchi; Hitoshi Yamauchi, and Munehiro Tomikawa, all of Tokyo, Japan, assignors to Daiichi Seiyaku Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 795,608, Nov. 6, 1984, abandoned. This application Nov. 16, 1987, Ser. No. 222,309
Claims priority, application Japan, Nov. 6, 1984, 59-233742
Int. Cl.[5] A61K *37/22;* A61J *5/04;* B32B *3/26*
U.S. Cl. 424—450 3 Claims

1. Lipid membrane structures comprising a lactose monofatty acid ester or a lactose monofatty acid ester amide, each comprising an acyl group having from 12 to 30 carbon atoms which is substituted for a hydroxyl group of a glucose moiety of lactose in the lipid membrane thereof at a molar ratio of at least about 1:40 based on the total lipid components, wherein said lipid structures are liposomes, micelles or microemulsions, wherein the lactose monofatty acid ester and the lactose monofatty acid amide is represented by the following chemical structure:



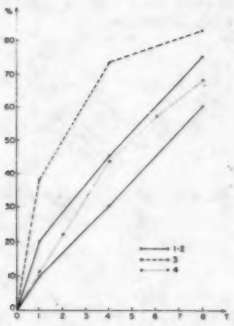
wherein one of R_1, R_2, R_3 and R_4 represents -O-acyl or -NH-acyl and the remaining three represent -OH.

4,960,596

SLOW-RELEASE PREPARATION OF DILTIAZEM, AND A MEDICINE PROVIDED THEREBY

Patrice Debregeas, Versailles; Gerard Leduc, Malesherbes, and Jean-Francois Boyer, Houdan, all of France, assignors to Ethypharm, Houdan, France

Filed Nov. 23, 1988, Ser. No. 275,354
Claims priority, application France, Nov. 26, 1987, 87 16425
Int. Cl.[5] A61K *9/56*
U.S. Cl. 424—458 **9 Claims**



1. A slow release acid-free Galenical preparation of pharmaceutically acceptable Diltiazem comprising microgranules of the type constituted by a central core coated with layers containing the active substance, with each microgranule having an outer membrane, the preparation being wherein its outer membrane is adapted to release the Diltiazem applied to the neutral core into an aqueous medium at the following rate measured using the method of the United States Pharmacopea No. 21:

(a) between 5% and 35% after one hour;

(b) between 15% and 40% after two hours;

(c) between 20% and 50% after three hours;

(d) between 30% and 75% after four hours;

(e) between 40% and 80% after six hours;

(f) between 55% and 95% after eight hours whereas said preparation, comprises, relative to the total weight of microgranules, 8% to 15% by weight of neutral core, layers of diltiazem comprising 60% to 85% by weight mixed with polyvinylpyrrolidone comprising 8% to 15% by weight, 0.1% to 10% by weight talc and 1% to 20% by weight outer membrane, and wherein the outer membrane comprises by weight of total microgranule weight, 2% to 5% shellac, 1% to 15% by weight ethylcellulose and 0.17to 4% by weight of plasticizer.

4,960,597

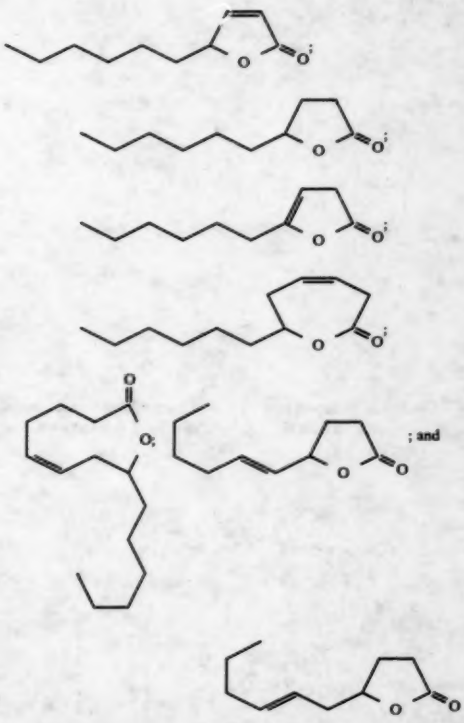
FLAVORING WITH MIXTURES OF LACTONES

Mohamad I. Farhood, Holmdel; James A. Morris, Wall; Mark A. Sprecker, Sea Bright; Lynda J. Bienkowski, Perth Amboy; Kevin P. Miller, Middletown; Manfred H. Vock, Locust, and Myrna L. Hagedorn, Edison, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Continuation-in-part of Ser. No. 228,512, Aug. 5, 1988, Pat. No. 4,946,782. This application Dec. 2, 1988, Ser. No. 279,065
Int. Cl.[5] A23L *1/226*
U.S. Cl. 426—3 **1 Claim**

1. A process for augmenting or enhancing the aroma or taste of a foodstuff or chewing gum comprising the step of adding to said foodstuff or chewing gum an aroma or taste augmenting or enhancing quantity of a mixture of unsaturated and saturated lactones, each of which is defined according to the structure:

wherein R represents C_6 alkyl or alkenyl; and X represents C_2, C_4 or C_6 alkylene or alkenylene; with the provisos that R is C_6 alkyl when X is C_2, C_4 or C_6 alkenylene and R is C_6 alkenyl when X is C_2, C_4 or C_6 alkenylene, said lactones having the structures:

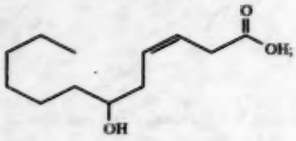


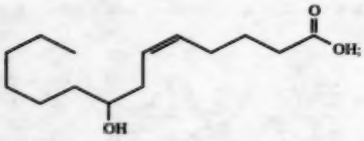
; and

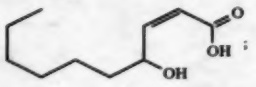
said process consisting of the sequential steps of:

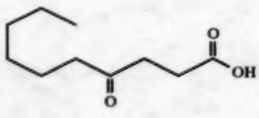
(i) fermentation at a pH in the range of from about 5.5 up to about 7 and at a temperature in the range of from about 20° C. up to about 35° C. castor oil, a castor oil hydrolysate or ricinoleic acid with a microorganism selected from the group consisting of:
Candida petrophilum ATCC 20226;
Candida olephilia, ATCC 20177;
Candida sp., ATCC 20504; and
Candida sake, ATCC 28137
whereby gamma hydroxydecanoic acid and a mixture of other acids defined according to the generic structure:

is formed having the specific structures:

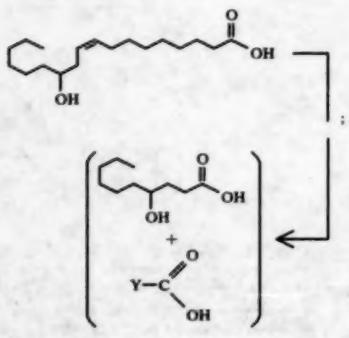




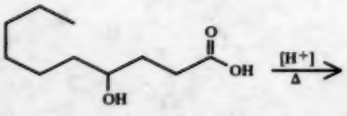




wherein Y represents an oxo-saturated, oxo-unsaturated or di-unsaturated C_9, C_{11} or C_{13} moiety according to the reaction:



(ii) effecting the lactonization of the resulting gamma hydroxydecanoic acid at a pH in the range of 0–5 and at a temperature in the range of from about 90° C. up to about 120° C. by means of simultaneous acidification and heating according to the reaction:



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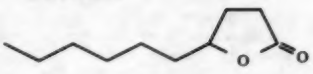
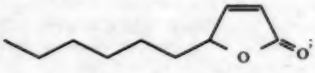


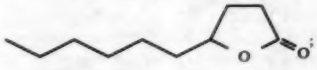
and then

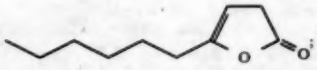
(iii) effecting lactonization by means of distillation at a temperature in the range of 120°–220° C. and at a pH of between about I and about 7 of the resulting acids defined according to the structure:

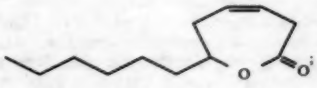
to form the mixture of lactone defined according to the structure:

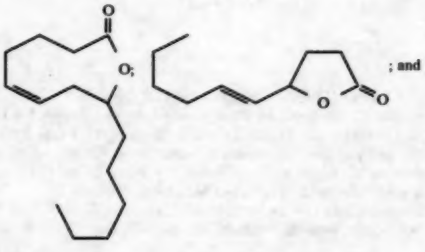
and having the structures:

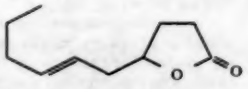




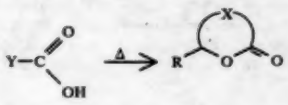








according to the reaction:



whereby the sum of the number of carbon atoms in the X moiety and in the R moiety is equal to the number of carbon atoms in the Y moiety minus 1.

4,960,598

PACKAGE ASSEMBLY INCLUDING A MULTI-SURFACE, MICROWAVE INTERACTIVE TRAY

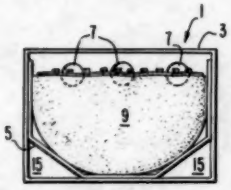
Anthony J. Swiontek, Neenah, Wis., assignor to James River Corporation, Norwalk, Conn.

Division of Ser. No. 829,227, Feb. 14, 1986. This application Oct. 5, 1988, Ser. No. 253,623

The portion of the term of this patent subsequent to Dec. 27, 2005, has been disclaimed.

Int. Cl.[5] B65D *81/34*

U.S. Cl. 426—107 **10 Claims**



1. Package assembly for the storing and microwave heating of a food item comprising:

(a) an outer package body defining an internal food receiving space;

(b) a food item within said food receiving space; and

(c) tray member disposed in the food receiving space of the outer package body and being formed of a microwave transparent material upon which a layer of a microwave interactive material, that is capable of converting microwave energy to heat, is disposed on one side thereof; wherein said tray member has a flat bottom wall for supporting said tray member, in use, upon a flat surface within a microwave oven for heating of the food item, and has upwardly directed sidewalls which, together with said flat bottom wall are sized and shaped relative to the food item so as to cradle the food item with multiple surfaces of the food item in sufficient proximity with respect to the microwave interactive layer for producing browning or crisping of said multiple surfaces during heating of the food item within the tray member in a microwave oven; and wherein a plurality of vent holes are formed in portions of said sidewalls in a vicinity of said bottom wall at each of opposite sides of the food item as a means for venting of gases and vapor released by the food item within said inner tray member during heating of the food item, away from said food item out of the tray member through said sidewalls.

4,960,599

COLD PARTICLE SUSPENSION AND INJECTION PROCESS FOR MEAT

Ivo Cozzini, Lincolnwood, Ill., and Matthew Walker, Marietta, Ga., assignors to Cozzini, Inc., Chicago, Ill.

Filed Sep. 20, 1989, Ser. No. 410,100

Int. Cl.[5] A23L *1/31*

U.S. Cl. 426—281 **4 Claims**

1. A process for injecting suspended trim into a mass of meat muscle, the steps of the process including:

(a) removing trim from meat of the same type as the meat to be injected, said trim consisting of fat and lean meat;

(b) freezing said trim;

(c) grinding said frozen trim in a grinding apparatus;

(d) cooling a brine solution to between approximately 16° F. and 20° F.;

(e) blending said ground frozen trim and said brine solution together at a ratio wherein the amount of brine is at least double the amount of trim by weight and maintaining the temperature of said blend at between approximately 16° F. and 24° F.;

(f) mixing said trim and brine solution until a saturated solution is achieved;

(g) milling said saturated solution until a complete suspension is achieved, having a temperature of 32° F. or less; and

(h) injecting said relatively lower temperature suspension into said relatively higher temperature meat muscle, said meat muscle having a temperature of between approximately 38° F. and 48° F., whereby said injection process increases the weight of said meat with no flavor loss.

4,960,600

POLYOL POLYESTERS AS A PROTECTIVE MOISTURE BARRIER FOR FOODS

Jeffrey J. Kester, West Chester; Christian A. Bernhardt, Fairfield; Joseph J. Elsen; James A. Letton, both of Cincinnati, and Mary M. Fox, Fairfield, all of Ohio, assignors to The Procter & Gamble Co., Cincinnati, Ohio

Filed Dec. 21, 1988, Ser. No. 287,923

Int. Cl.[5] A23B *4/10*

U.S. Cl. 426—310 **18 Claims**

1. A method for reducing the rate or moisture transmission into and out of foods comprising enveloping the foods with a thin continuous coating comprising an effective amount of polyol fatty acid esters, wherein the polyol fatty acid esters have at least 4 fatty acid ester groups, wherein at least about 90% of the fatty acids contain not less than 16 carbon atoms, wherein the polyol polyester has a solid fat content between about 3% and about 10% at 100° F., wherein the coating is done by a process selected from the group consisting of spraying, pouring, pan coating, brushing, applying with a roller, rolling in a container, using a falling film method, enrobing, curtain coating, immersing at a temperature below 250° F., and combinations thereof, and wherein the food is selected from the group consisting of breakfast cereals, bakery products, dehydrated foods, fruits, vegetables, meats, frozen foods, filled pastries, pies, confectioneries, and mixtures thereof.

4,960,601

METHOD FOR PUMPING, HOMOGENIZING AND DIVIDING DOUGH AND THE LIKE

Donald L. Cummins, Mechanicsville, Va., assignor to AMF Machinery Systems, Inc., Richmond, Va.

Filed Jun. 19, 1989, Ser. No. 367,616

Int. Cl.[5] A21D *6/00*

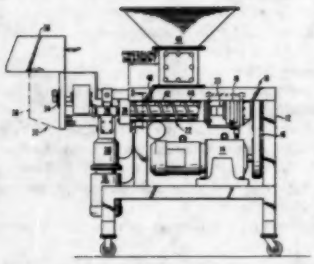
U.S. Cl. 426—504 **11 Claims**

1. A method of pumping and homogenizing material similar to dough to a uniform density and texture from the lower portion of a mass of said material comprising the steps of:

moving the material from the lower portion of the mass of said material with a pair of open-flighted augers each with

a helical flight and haft with said flight positioned about said shaft with the flight of the first of said augers projecting and interposed into the space formed by the flight of the second of said augers with substantial longitudinal clearance between adjacent interposed flights of one auger and the interposed flights of the adjacent auger;

moving the material by said augers along a path through a trough and into a pressurizing tunnel where the clearance



between said tunnel and said pair of augers is minimal and the clearance between the flights of one auger in the tunnel and the shaft of the adjacent auger in the tunnel is minimal;

homogenizing and pressurizing said material in said tunnel by rotating said augers at sufficient speed to cause a slippage between said flights and said material to impart a pressure and uniform density and texture thereto; and

dispensing said uniform material from said tunnel.

4,960,602

FOOD OR BEVERAGE COMPOSITIONS WITH ALTERED FLAVORED DISPLAY

Sherry R. Talkington, Florence, Ky.; Susan S. Abe, Mason, and Marko D. Mijac, Cincinnati, both of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Continuation of Ser. No. 175,406, Apr. 13, 1988, abandoned, which is a continuation-in-part of Ser. No. 47,367, May 6, 1987, abandoned. This application Jun. 30, 1989, Ser. No. 374,430

Int. Cl.[5] A23D *9/00*

U.S. Cl. 426—534 **16 Claims**

1. An edible composition with altered flavor display selected from the group consisting of foods and beverages, wherein the composition comprises:

(A) from about 5% to about 100% fat phase, wherein the fat phase comprises:

(i) from about 5% to about 95% sucrose fatty acid ester containing at least four fatty acid ester groups, each fatty acid group having from about 8 to about 22 carbon atoms, wherein the sucrose fatty acid ester has an octaester content of at least about 75% and an iodine value between about 25 and 55, and wherein the sucrose fatty acid ester has, at 100° F. (37.8° C.):

(a) a viscosity of not less than 15 poise at 100° F. (37.8° C.) after 10 minutes of steady shear at a shear rate of 10 $sec.^{-1}$,

(b) a liquid/solid stability of not less than 50 percent at 100° F. (37.8° C.);

(ii) wherein the sucrose fatty acid ester comprises not more than about 50% of the total edible composition;

(iii) from about 5% to about 95% triglyceride fat; and

(iv) from about 0% to about 50% fat ingredients selected from the group consisting of fatty acids, fatty alcohols, esters of fatty acids, esters of fatty alcohols, noncaloric fats, reduced calorie fats, polyol fatty acid polyesters not meeting the limitations of subpart (i) of claim 1 hereinabove, and mixtures thereof;

(B) from about 0% to about 95% nonfat ingredients selected from the group consisting of nonfat food ingredients and nonfat beverage ingredients, and mixtures thereof; and

(C) wherein the edible composition contains flavor compounds having a polarity not less than the polarity of diacetyl (octanol/water partition coefficient not more than 0.037).

4,960,603

USE OF SCLAREOLIDE IN AUGMENTING OR ENHANCING THE ORGANOLEPTIC PROPERTIES OF FOODSTUFFS

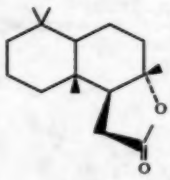
Lawrence L. Buckholz, Jr., Middletown; Mohamad I. Farbood, Holmdel, both of N.J.; Nicolas Kossiakoff, Chambourcy, France; Lewis G. Scharpf, Fair Haven, and Eugene W. Seitz, Middletown, both of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Continuation-in-part of Ser. No. 474,410, Jan. 2, 1990, which is a continuation of Ser. No. 418,171, Sep. 29, 1989, Pat. No. 4,917,913. This application Jun. 8, 1990, Ser. No. 534,880

Int. Cl.[5] A23L *1/226;* **A22C** *25/00*

U.S. Cl. 426—536 **1 Claim**

1. A textured fish product having added thereto from 0.5 to 100 ppm of sclareolide having the structure:



4,960,604

ORIENTAL NOODLE PREPARED FROM A CROSS-LINKED POTATO OR SWEET POTATO STARCH

Chung-wai Chiu, Westfield, N.J., and Hunter Chun, Bukit Batok, assignors to National Starch and Chemical Investment Holding Corporation, Wilmington, Del.

Division of Ser. No. 133,777, Dec. 16, 1987, Pat. No. 4,871,572. This application Mar. 13, 1989, Ser. No. 322,022

Int. Cl.[5] A23L *1/0522*

U.S. Cl. 426—557 **20 Claims**

1. An extruded oriental noodle, consisting essentially of a starch and wafer, characterized in that the starch is a crosslinked granular potato starch or a crosslinked granular sweet potato starch, the granular potato starch being crosslinked sufficiently to have a sediment volume of about 3–11 ml and the sweet potato starch being crosslinked to have a sediment volume of about 2–4 ml.

4,960,605

GRATED HARD PARMESAN CHEESE AND METHOD FOR MAKING SAME

Gary W. Trecker, Wheeling, and Susan P. Monckton, Glen Ellyn, both of Ill., assignors to Kraft, Inc., Glenview, Ill.

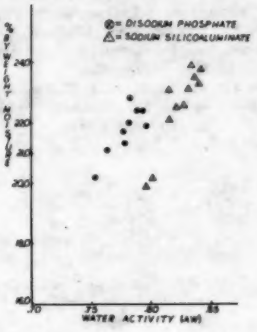
Filed Aug. 3, 1989, Ser. No. 389,292

Int. Cl.[5] A23C *19/086, 19/097*

U.S. Cl. 426—582 **16 Claims**

1. Parmesan cheese particles which are shelf stable and which resist agglomeration and oil-off, said particles having a

moisture content when packaged of from about 19% to about 24% and said particles consisting of disodium phosphate at a



level sufficient to provide agglomeration and oil-off resistant properties.

4,960,606

MICROBIALLY-STABLE SHORTENING CONTAINING BUTTER

Thomas G. Crosby, Bourbonnais, Ill., assignor to Bunge Foods Corporation, Bradley, Ill.

Filed Jul. 7, 1988, Ser. No. 216,111

The portion of the term of this patent subsequent to Oct. 9, 2007, has been disclaimed.

Int. Cl.[5] A23C *15/12*; A23D *7/00, 9/00*

U.S. Cl. 426—602 **13 Claims**

1. A ready-to-use shelf-stable shortening composition that contains a butter component, the shortening composition comprising:

at least about 70 weight percent, based upon the total weight of the composition, of an edible liquid shortening base component;

in excess of about 1 weight percent, based upon the total weight of the shortening composition, of a butter component, wherein said butter component is selected from the group consisting of whole butter, butter substitutes including dairy ingredients, and mixtures thereof;

a water component in an amount less than approximately 10 weight percent, based upon the total weight of the shortening composition;

a salt component present at a level which is in excess of its saturation level in the water component at ambient temperature; and

said shortening composition is microbiologically stable at ambient, non-refrigerated temperatures as well as at refrigerated temperatures.

4,960,607

METHOD FOR WEB COATING BY MEANS OF AN ELECTRON BEAM

Manfred Neuman; Gerhard ZeiBig; Karl-Heinz Ihle; Eckehard Madler; Siegfried Schiller, and Rudolf Schroller, all of Dresden, German Democratic Rep., assignors to Bakish Materials Corporation, Englewood, N.J.

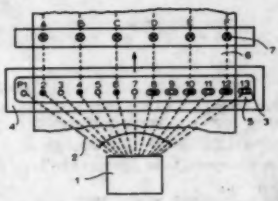
Filed Apr. 10, 1989, Ser. No. 335,345

Claims priority, application German Democratic Rep., Apr. 27, 1988, 315108

Int. Cl.[5] B05D *3/06*

U.S. Cl. 427—8 **10 Claims**

1. In a method for coating strip material by means of an electron beam line evaporator, deflecting in a time-invariant program the electron beam to a plurality of dwell points arranged along a path normal to the direction of strip travel, sensing film thickness in a time-variant programmed mode at a plurality of positions arranged along a course normal to said direction of strip travel and subsequent to said path is said direction of strip travel, controlling in accordance with said



programmed mode the dwell of said electron beam at selected dwell points to provide uniform film thickness distribution on said strip.

4,960,608

MANUFACTURING PROCESS OF A PHOTOCATHODE FOR AN IMAGE INTENSIFIER TUBE

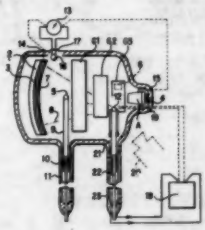
Gerard Vieux, Grenoble; Daniel Boisson, Le Grand Lemps; Paul de Groot, St Ismier, and Gilbert-René Colomb, Voiron, all of France, assignors to Thomson-CSF, Paris, France

Filed Jan. 12, 1989, Ser. No. 296,128

Claims priority, application France, Jan. 15, 1988, 88 00411

Int. Cl.[5] B05D *5/12*

U.S. Cl. 427—10 **13 Claims**



1. A manufacturing process of a photocathode for an image intensifier tube, said tube comprising a vacuum enclosure containing the photocathode, an anode and one or several electrodes located between the anode and the photocathode, said process consisting of depositing a photoelectric material on a conductive substrate by vacuum evaporation of said material, and of checking, during the evaporation, the optical transparency of the deposit by illuminating said deposit by means of a light source, said light source being located within the tube and dispersed as to be protected against the vapours of said material.

4,960,609

PROCESS FOR BONDING LUBRICANT TO A THIN FILM MAGNETIC RECORDING DISK

Andrew M. Homola, Morgan Hill; Li-Ju J. Lin, San Jose, and David D. Saperstein, Portola Valley, all of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 13, 1989, Ser. No. 434,151

Int. Cl.[5] B05D *3/06*

U.S. Cl. 427—38 **6 Claims**

1. A process for bonding a fluoroether lubricant to a thin film magnetic recording disk of the type having a protective overcoat consisting essentially of carbon, the process comprising the steps of:

applying a fluoroether lubricant to the carbon overcoat surface; and

thereafter exposing the lubricated disk to a plasma of an essentially inert gas.

4,960,610

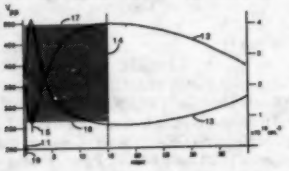
METHOD OF TREATING SEMICONDUCTOR WAFERS IN A MAGNETICALLY CONFINED PLASMA AT LOW PRESSURE BY MONITORING PEAK TO PEAK VOLTAGE OF THE PLASMA

Ole Krogh, San Francisco, Calif., assignor to Tegal Corporation, Petaluma, Calif.

Division of Ser. No. 267,193, Nov. 4, 1988. This application Nov. 13, 1989, Ser. No. 434,197

Int. Cl.[5] B05D *3/06*; H01L *21/306*

U.S. Cl. 427—39 6 Claims



1. In a process for treating a semiconductor wafer in a chamber containing an RF induced, magnetically confined glow discharge at a pressure below two hundred millitorr, the improvement comprising the steps of:

monitoring the peak to peak voltage in said chamber; and

maintaining the gas pressure within said chamber at a value corresponding approximately to the minimum peak to peak voltage.

4,960,611

METHOD OF REMEDYING COATING

Atsuhisa Fujisawa, Kobe; Masuo Ojima, Amagasaki; Kenji Wakabayashi, Kobe; Souji Omoto, Takarazuka, and Toyokazu Shimizu, Osaka, all of Japan, assignors to Kansai Paint Company, Limited, Amagasaki, Japan

Filed Sep. 29, 1988, Ser. No. 250,643

Claims priority, application Japan, Sep. 30, 1987, 62-248375; Jun. 10, 1988, 63-144492; Jun. 10, 1988, 63-144494

Int. Cl.[5] B05D *3/06*

U.S. Cl. 427—43.1 16 Claims

1. A method of remedying a coating characterized by irradiating a minute defect in the coating due to the adhesion of a defect causing agent with a laser beam, having a cross section generally in conformity with the defect, to sublime the defect causing agent and the coating at the defective portion and to form a minute cavity in the coating, filling a repair coating composition into the cavity and curing the composition.

4,960,612

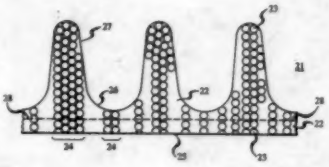
THERMAL CONDUCTOR ASSEMBLY METHOD

Mark S. Dentini, Holland, Pa.; Joe A. Fulton, Ewing, N.J.; Sungho Jin, Millington, N.J.; John J. Mottine, Jr., West Keansburg, N.J.; Lloyd Shepherd, Madison, N.J., and Richard C. Sherwood, New Providence, N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Division of Ser. No. 69,792, Jul. 2, 1987, Pat. No. 4,838,347. This application Dec. 27, 1988, Ser. No. 290,550

Int. Cl.[5] B05D *3/14*

U.S. Cl. 427—47 9 Claims



1. A process for making a thermally conductive compressible sheet comprising the steps of: forming a first layer of uncured elastomer, having first magnetic particles dispersed therein; subjecting the first layer to a first magnetic field for aligning the first magnetic particles so as to form spaced to columns of such first magnetic particles; partially curing the first layer; forming over the partially cured first layer a second layer of uncured elastomer containing second magnetic particles dispersed therein; applying a second magnetic field across the first and second layers of such magnitude as to cause finger-like protrusions, each having a length which is greater than its width or its thickness, to form extending from the second layer; and curing the first and second layers so as to stabilize permanently said finger-like protrusions.

4,960,613

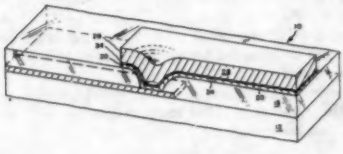
LASER INTERCONNECT PROCESS

Herbert S. Cole, Scotia, and Yung S. Liu, Schenectady, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Oct. 4, 1988, Ser. No. 253,020

Int. Cl.[5] B05D *3/06, 5/12, 3/02*

U.S. Cl. 427—53.1 18 Claims



1. A process for forming a desired conductor pattern on a patterned surface of a substrate comprising:

providing said patterned substrate, said substrate including a surface pattern of areas having differing characteristics selected from the group consisting of composition, optical reflectivity, optical absorptivity and thermal conductivity;

providing a buffer layer on said substrate patterned surface, said buffer layer extending across at least two areas of said surface pattern having differing characteristics;

laser illuminating said buffer layer in said desired conductor pattern in the presence of a catalyst source compound to form a layer of an electroless plating catalyst on said buffer layer in said desired conductor pattern;

said formation of said catalyst pattern being by decomposition of said catalyst source compound to provide said catalyst on said buffer layer and where said differing

characteristics would affect said decomposition in the absence of said buffer layer; and

exposing said catalyst patterned buffer layer to an electroless plating environment to deposit electroless metal on said buffer layer in a pattern determined by the pattern of said catalyst.

4,960,614

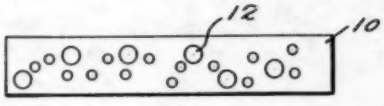
PRINTED CIRCUIT BOARD

David Durand, Providence, R.I., assignor to Key-Tech, Inc., Cranston, R.I.

Continuation-in-part of Ser. No. 11,975, Feb. 6, 1987, Pat. No. 4,863,757. This application Jun. 14, 1989, Ser. No. 365,712

Int. Cl.[5] B05D *3/06*

U.S. Cl. 427—54.1 **9 Claims**



1. A method for producing a circuit board having conductive circuit elements with a specific resistivity of less than 0.05 ohm-cm^2 patterned on a nonconductive substrate comprising:

a. printing a U.V. curable ink onto the nonconductive substrate in a desired circuit pattern, and

b. effecting U.V. radiation cure of the U.V. curable ink by exposing said U.V. curable ink to a U.V. source having an output in a region between 360 nm and 420 nm in a pulsing manner consisting of 5 to 8 one-half second exposure periods, each exposure period followed by a non-exposure period of about 2 to 3 seconds.

4,960,615

COMPOSITION AND METHOD FOR USING COMPOSITION TO REDUCE THE EFFECTS OF WATER AND ULTRAVIOLET RADIATION ON CARBON CENTRAL STRUCTURES

Mike F. Stout, 12101 Windmill Rd., Oklahoma City, Okla. 73162; Dean E. Brunken, 3601 NE. 140th Terrace Ct., Edmond, Okla. 73013, and Arnulf P. Hagen, Rte. 1, Box 466H, Noble, Okla. 73068

Continuation-in-part of Ser. No. 94,650, Sep. 9, 1987, abandoned. This application Dec. 27, 1988, Ser. No. 290,025

Int. Cl.[5] B05D *5/00*

U.S. Cl. 427—160 **2 Claims**

1. A method for treating wood or paper comprising the step of applying a composition capable of reducing the effects of ultraviolet radiation and water to the wood or paper surface wherein the composition comprises:

a silane or siloxane or combination thereof; and

a catalyst;

wherein the silane has the general formula:

$$R_m—Si—X_{4-m}$$

wherein

m is 1 or 2; and

X is a halogen, hydroxyl, R or R_1;

R is an ultraviolet radiation absorber bonded directly to the silicon atom and is capable of reducing the effects of ultraviolet radiation on wood or paper selected from a grouping of unsaturated or aromatic compounds, and R_1 being an alkyl group containing from 1 to about 8 carbon atoms, a hydroxyalkyl group, or an alkoxyalkyl group; and

wherein the siloxane is represented by the general structure or formula:

wherein R_2 and R_3 are bonded directly to the silicon atom and are ultraviolet radiation absorbers capable of reducing the effects of ultraviolet radiation on wood or paper and are independently selected from a grouping of unsaturated or aromatic compounds, and Y is an integer between 1 and about 100; and wherein W is a halogen, hydroxyl, alkyl, aryl or alkoxy,

wherein the composition is not an emulsion and is not cured by ultraviolet radiation, and further comprising:

a catalytically effective amount of titanium acetylacetonate and dibutyl tin dilaurate.

4,960,616

CORRUGATED ROOFING SHEETS OF SYNTHETIC FIBER-REINFORCED CEMENT, WITH A ROUGH SURFACE DUE TO THE PRESENCE OF GRANULAR MATERIAL

Silvio Magnani, Cannetp Pavese, Italy, assignor to CIF Compagnia Italiana Finanaziaria Spa, Italy

Continuation of Ser. No. 208,482, Jun. 20, 1988, abandoned. This application Jan. 16, 1990, Ser. No. 464,566

Claims priority, application Italy, Jul. 1, 1987, 21920[U]

Int. Cl.[5] B05D *1/06*

U.S. Cl. 427—186 **8 Claims**

1. A method of producing corrugated self supporting roofing sheets which consist essentially of a mixture of cement, inert materials and synthetic fiber reinforcement in mesh form, with a rough top surface of granular material, comprising the steps of:

preparing a mixture of cement, water and inert materials;

supporting synthetic fibers in mesh form on a continuously advancing felt or cloth band;

applying said mixture onto said mesh, forming a layer of suitable thickness which includes said mesh;

applying a granular material onto the top surface of said layer before the cement has set;

removing excess water from said layer;

corrugating said layer;

cutting said layer, thereby forming corrugated roofing sheets of desired length; and

brushing the top surface of said sheets, after the cement has set, to remove unadhered granules of the granular material.

4,960,617

POST-REACTOR STABILIZATION OF POLYOLEFINS

Ananda M. Chatterjee, and Dale J. Wilpers, both of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Division of Ser. No. 161,873, Feb. 29, 1988. This application Apr. 3, 1989, Ser. No. 331,761

Int. Cl.[5] B05D *7/00*

U.S. Cl. 427—222 **11 Claims**

1. A process for post-reactor stabilization of polyolefins comprising:

melting a polyolefin wax (that is forming a liquid);

blending at least one additive into the liquid polyolefin wax;

fluidizing polyolefin particles to be stabilized with a hot gas;

spraying the liquid polyolefin wax containing at least one additive on the fluidized polyolefin particles, and forming at least partially coated polymer particles;

maintaining the at least partially coated polymer particles and fluidized polyolefin particles at a temperature which is sufficiently high to prevent the formation of fibers from

the wax and which enhances the formation of stabilized polymer particles.

4,960,618

PROCESS FOR FORMATION OF METAL OXIDE FILM

Katsuya Tanitsu, Kawasaki; Muneo Nakayama, Tokyo, and Yoshimi Sato, Mishima, all of Japan, assignors to Tokyo Ohka Kogyo Co., Ltd., Japan

Division of Ser. No. 141,075, Jan. 5, 1988, Pat. No. 4,908,065. This application Jan. 8, 1990, Ser. No. 461,873
Claims priority, application Japan, Jan. 7, 1987, 62-000556
Int. Cl.[5] B05D *3/02, 5/00*
U.S. Cl. 427—226 **2 Claims**

1. A process for the formation of a metal oxide film, which comprises the following consecutive steps:

(i) coating a substrate with a coating solution for use in the formation of the metal oxide film, said solution comprising:

(a) a β-diketone;

(b) at least one element or compound selected from the group consisting of elements capable of forming complexes with said β-diketone, salts of the elements and hydrolysates of alkoxides of the elements; and

(c) an aprotic polar solvent; and

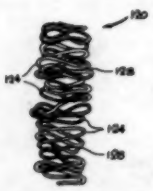
(ii) subjecting the thus-coated substrate to a heat treatment at a temperature of at least 100° C.

4,960,619

METHOD FOR DEPOSITING ADHESIVE IN A RECIPROCATING MOTION

Fred A. Slautterback, Carmel Valley; W. Harrison Faulkner, III, Salinas, and Bradley P. Lesko, Seaside, all of Calif., assignors to Slautterback Corporation, Monterey, Calif.

Division of Ser. No. 214,296, Jun. 30, 1988, Pat. No. 4,844,003. This application May 1, 1989, Ser. No. 346,149
Int. Cl.[5] B05D *1/36*
U.S. Cl. 427—265 **17 Claims**



1. A method of depositing hot-melt adhesive on a substrate comprising,

directing an on-the-fly linear flow of adhesive at a substrate advancing along a path, and

striking said on-the-fly linear adhesive flow at opposed sides with a plurality of independently directed streams of gas, the streams of gas exerting a deflecting force which redirects said linear adhesive flow in pendulum fashion defined by reciprocation primarily perpendicular to said path of substrate advancement.

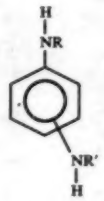
4,960,620

COATING METHOD FOR ROOM-TEMPERATURE-CURED POLYURETHANES AND POLYUREAS

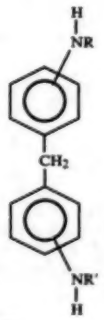
David W. House, Arlington Heights, and Ray V. Scott, Jr., Addison, both of Ill., assignors to UOP, Des Plaines, Ill.

Continuation-in-part of Ser. No. 208,355, Jun. 17, 1988, Pat. No. 4,874,831. This application Jun. 19, 1989, Ser. No. 368,462
Int. Cl.[5] C08G *18/18*
U.S. Cl. 427—385.5 **29 Claims**

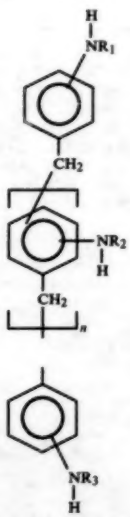
1. A method for coating or patching pavement with a polyurethane or polyurea composition comprising applying to said pavement or cavity therein a coating composition comprising a backbone polyol or polyamine, a polyisocyanate and a primary amine-free curing composition comprising an aromatic alkyl-substituted secondary polyamine having a structure selected from the group consisting of



(1)



(2)



(3)

where R, R', R_1, R_2 and R_3 may be independently selected and are alkyl groups containing from 1 to about 20 carbon atoms, provided further that R_2 may be H and one of R_1 or R_3 may, additionally, be H and n is an integer from 1 to about 10, in the presence of a catalytic composition comprising an organometallic catalytic compound, whereby the components of said coating composition will react at ambient conditions to form said polyurethane or polyurea composition.

4,960,621

METHOD OF INSULATING WITH INORGANIC NON-COMBUSTIBLE FOAM

John S. Luckanuck, Burlington, Canada, assignor to Radix/World, Ltd., Burlington, Canada

Filed Aug. 30, 1989, Ser. No. 400,451
Int. Cl.[5] B05D 3/02
U.S. Cl. 427—397.8 3 Claims

1. A method of applying an inorganic non-combustible foam comprising the steps of providing about 64% of sodium silicate having an $SiO_2.Na_2O$ ratio of about 2.9 in one package, providing in another package about 8% sodium silico fluoride, about 8% silicon metal and about 20% of a filler, said filler being a member selected from the class consisting of Wollastonite, perlite and mixtures thereof, mixing the contents of the two packages and applying the mixed contents to an area to be rendered fire retardant, said mixed contents having a volume at least 6 times that of the added volumes of the packaged contents.

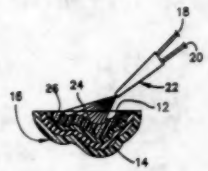
3. The method of claim 1 in which said applying step is performed at a temperature above about 100° F. and approximately 5 to 30 minutes after mixing.

4,960,622

ARTIFICIAL URETHANE ROCK

Enos D. Jarboe, University City; Rodney D. Jarboe, Creve Coeur, and Edward M. Barclay, Affton, all of Mo., assignors to Futura Coatings, Inc., St. Louis, Mo.

Continuation-in-part of Ser. No. 128,029, Dec. 3, 1987, Pat. No. 4,847,026. This application Jul. 10, 1989, Ser. No. 377,884
Int. Cl.[5] B29C 67/20; B44F 9/04
U.S. Cl. 428—15 9 Claims



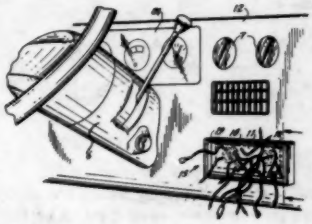
1. A molded artificial urethane rock, said rock being self-supporting and having a high structural load bearing strength, said rock being produced by a method for molding the artificial urethane rock which comprises selecting a rock to be reproduced, creating a flexible rubber mold and supporting cradle having a mold cavity conforming to the exterior of said rock, said mold having a substantial degree of flexibility and being created by applying a liquid uncured rubber forming material to said rock, curing said uncured liquid rubber forming material to produce said rubber mold, said cradle being formed by applying by spraying a low density urethane foam forming mixture to the exterior of the rubber mold to provide a self-supporting cradle, spraying a two sided urethane composition into the mold cavity, said urethane composition comprising an isocyanate side and a polyol side and being mixed in a spray gun in a spray-in-mold process, carrying out said spraying to build up the molded artificial urethane rock to a desired thickness and stripping said cradle and mold from the molded artificial urethane rock after curing.

4,960,623

AUTOMOBILE ELECTRONIC-COMPONENT ANTI-THEFT DEVICE

Gerald C. Levinson, 3408 Manhattan Ave., Manhattan Beach, Calif. 90266

Filed Oct. 6, 1989, Ser. No. 418,161
Int. Cl.[5] B60K 35/00; F41H 3/00
U.S. Cl. 428—31 15 Claims



1. An anti-theft assembly for a car electronic component disposed in a dashboard of a car comprising:

means for substantially covering said car electronic component;

means for selectively mounting said covering means over said car electronic component; and

a plurality of wire elements projecting from said covering means.

4,960,624

FLUOROELASTOMER COMPOSITION AND HEAT SHRINKABLE ARTICLES COMPRISING SAME

Keiji Ueno, Osaka, Japan, assignor to Sumitomo Electric Industries, Ltd., Osaka, Japan

Continuation of Ser. No. 862,922, May 14, 1986, abandoned. This application Apr. 29, 1988, Ser. No. 188,724
Claims priority, application Japan, May 14, 1985, 60-102266; May 14, 1985, 60-102267
Int. Cl.[5] F16L 11/06; C08F 14/22, 14/26, 14/28
U.S. Cl. 428—35.1 6 Claims

1. A fluoroelastomer composition consisting of a mixture of a first copolymer, a second copolymer and a cross-linking agent, said first copolymer consisting essentially of monomers of tetrafluoroethylene and propylene and being present in an amount of 100 parts by weight; said second copolymers consisting essentially of monomers of vinylidenefluoride and fluoroolefin and being present in an amount not smaller than 1 part by weight and smaller than 100 parts by weight; said vinylidene fluoride-fluoroolefin copolymer having a fluoroolefin content of 1 to 20 mol%, said flouroolefin in said vinylidene fluoride-fluoroolefin copolymer being selected from the group consisting of hexafluoropropylene and tetrafluoroethylene, said first and said second copolymers essentially not being copolymerized with each other, and said mixture having been cross-linked by irradiation with electron beams the cross-linked mixture having a brittleness temperature of about −10° C. or below.

4,960,625

WEB-LIKE FILL ELEMENT

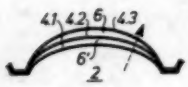
Gösta Rosendahl, Brännkyrkagatan 68, Stockholm S-11723, Sweden

PCT No. PCT/SE87/00330, § 371 Date Jan. 13, 1989, § 102(e) Date Jan. 13, 1989, PCT Pub. No. WO88/00630, PCT Pub. Date Jan. 28, 1988

PCT Filed Jul. 8, 1987, Ser. No. 299,963

Int. Cl.[5] B32B *1/08;* E04B *1/78;* B63C *7/12*

U.S. Cl. 428—35.3 8 Claims



1. A web-like element for filling limited spaces, which comprises a gas-filled continuous tubular casing having a flexible wall defining opposing halves of an interior peripheral surface and successive closure portions formed by joining and hermetically sealing spaced juxtaposed portions of the opposing halves of the interior peripheral surface to each other, the successive closure portions dividing the web-like element into a continuous series of permanently and hermetically sealed gas pockets defined by the tubular casing wall, the casing wall comprising a laminate of three layers of polyethylene film, each laminate layer having a thickness of 0.03 mm, and an exterior aluminum coating.

4,960,626

CONTAINER FOR PHOTOGRAPHIC FILM CARTRIDGE

Mutsuo Akao; Seiichi Watanabe, and Takuichi Komatsu, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

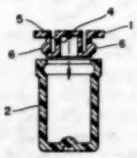
Continuation of Ser. No. 60,537, Jun. 11, 1987, abandoned. This application Jun. 8, 1989, Ser. No. 364,557

Claims priority, application Japan, Jun. 11, 1986, 61-133902

The portion of the term of this patent subsequent to Jul. 4, 2006, has been disclaimed.

Int. Cl.[5] B65D *85/00*

U.S. Cl. 428—36.92 5 Claims



1. In a container for a photographic film cartridge having a body and a cap, said cap being fitted to said body and said cap being made of a high-pressure branched low-density polyethylene resin, the improvement comprising that said polyethylene resin of said cap has a melt index of 7 to 40 g/10 minutes and a density of 0.918 to 0.930 g/cm^3 and contains 0.05 to 1 wt. % of a fatty acid amide lubricant and said cap has a bending rigidity of 1200 to 1400 kg/cm^2.

4,960,627

OPTICAL RECORDING MEDIA AND PROCESS FOR PREPARING SAME

Hisaharu Toibana; Mitsuyuki Kuroiwa, and Akira Todo, all of Ichihara, Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

Filed Apr. 20, 1989, Ser. No. 340,692

Claims priority, application Japan, Apr. 22, 1988, 63-99383; Apr. 22, 1988, 63-99386

Int. Cl.[5] B32B *3/02*

U.S. Cl. 428—64 8 Claims

1. An optical recording medium comprising a substrate and a recording layer formed thereon, in which the recording layer is irradiated with a beam of energy to form thereon bits corresponding to given pieces of information and thereby recorded the pieces of information, said recording layer having a film thickness of about 100 Å to about 1 μm and consisting essentially of Te and Cr, and the proportion of Cr contained in said recording layer is 0.1–10 atom% based on the total atoms constituting the recording layer.

4,960,628

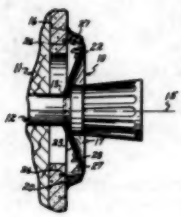
METHOD AND APPARATUS FOR IN SITU FORMING OF A WALL PLATE GASKET

William C. Stumphauzer, and Raymond M. Fetcenko, both of Elyria, Ohio, assignors to Nordson Corporation, Westlake, Ohio

Filed Aug. 10, 1989, Ser. No. 392,058

Int. Cl.[5] B32B *1/04, 1/10;* E05B *15/02;* H02G *3/14*

U.S. Cl. 428—81 24 Claims



1. An article comprising:

a plate member for mounting to a structure in order to seal said member to said structure;

a first surface on said plate member adapted to be directed away from said structure;

a second surface on said plate member adapted to face said structure;

an in situ formed resilient gasket secured to said second surface for effectively sealing said plate member to said structure when said plate member is mounted thereon; and

an insert located on said second side of said plate member adjacent said gasket, said insert acting as a mold dam surface during in situ molding of said gasket and being removable from said plate member prior to mounting of said plate member to said structure.

4,960,629

FIBER REINFORCED COMPOSITE ARTICLE

David C. Jarmon, Kensington, and Karl M. Prewo, Vernon, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Continuation of Ser. No. 132,398, Dec. 15, 1987, abandoned. This application Jun. 28, 1989, Ser. No. 372,104

Int. Cl.[5] B32B *5/12, 15/00, 5/06*

U.S. Cl. 428—113 6 Claims

1. A consolidated fiber reinforced glass matrix composite article, comprising:

from about 20 volume percent to about 50 volume percent glass or glass ceramic matrix,

from about 5 volume percent to about 50 volume percent inorganic monofilament fiber reinforcement wherein the individual monofilament fiber diameter is greater than about 100 microns, and

from about 15 volume percent to about 50 volume percent inorganic yarn fiber reinforcement wherein the individual yarn fiber diameter is less than about 30 microns,

wherein the monofilament fiber reinforcement includes a plurality of substantially parallel monofilament fibers arranged in a first layer during a preliminary layup of the article,

wherein the yarn fiber reinforcement includes a plurality of substantially parallel yarn fibers arranged during the preliminary layup in a second layer, the yarn fiber layer disposed adjacent to the first layer with the yarn fibers oriented substantially parallel to the monofilament fibers, and

wherein the monofilament fiber reinforcement and yarn fiber reinforcement are selectively distributed in the glass or glass ceramic matrix so that each monofilament fiber, following consolidation of the preliminary layup, is separated from adjacent monofilament fibers by yarn fiber reinforcement in glass or glass ceramic matrix to provide a consolidated fiber reinforced glass matrix article which exhibits high tensile strength, high elastic modulus, and high fracture toughness.

4,960,630

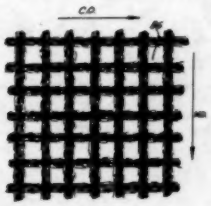
APPARATUS FOR PRODUCING SYMMETRICAL FLUID ENTANGLED NON-WOVEN FABRICS AND RELATED METHOD

John M. Greenway, Westwood, Mass.; Walter E. Schortmann, Cumberland, R.I.; Peter Mancini, Walpole, Mass.; Dennis Metrick, Cumberland, R.I., and Timothy Connolly, Norwood, Mass., assignors to International Paper Company, Purchase, N.Y.

Filed Apr. 14, 1988, Ser. No. 181,284

Int. Cl.[5] B32B *3/10*

U.S. Cl. 428—131 49 Claims



48. A non-woven fabric which comprises:

a symmetrical array of fluid entangled fibers including a lattice structure of spaced parallel machine direction ("MD") oriented rows of criss-crossing fibrous bands, and spaced cross-direction ("CD") oriented fibrous bands, said CD and MD fibrous bands intersecting at dense fiber nodes,

said CD and MD fibrous bands defining void areas which occupy at least 25 per cent of the fabric area,

said symmetrical array of fibers having a uniform cohesive grab tensile MD and CD strengths of at least 2 lbs/inch and 1 lb/inch, respectively, and an MD/CD ratio in the range of 1:1–4:1.

4,960,631

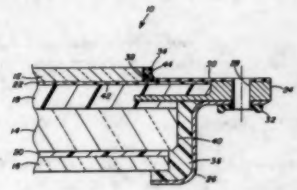
MOISTURE SEAL FOR AIRCRAFT WINDOWS

Patricia B. Walters, Harvest, and David C. Allen, Huntsville, both of Ala., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Dec. 30, 1988, Ser. No. 292,042

Int. Cl.[5] B32B *27/38, 17/06, 17/10*

U.S. Cl. 428—192 15 Claims



1. A laminated transparency comprising:

a rigid substrate;

a flexible ply secured to said rigid substrate; and

a flexible epoxy moisture sealant about the peripheral edge of said transparency.

4,960,632

THERMAL TRANSFER MATERIAL

Koichi Tohma, Kawasaki; Tetsuo Hasegawa, Tokyo; Naoki Kushida, Yokohama; Yasuyuki Tamura, Yokohama; Hisao Yaegashi, Yokohama, and Takayuki Suzuki, Saitama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 18, 1987, Ser. No. 98,320

Claims priority, application Japan, Sep. 24, 1986, 61-226823

Int. Cl.[5] B41M *5/26*

U.S. Cl. 428—212 7 Claims

1. A thermal transfer material, comprising: a support and at least a first ink layer and a second ink layer disposed in the order named on the support, wherein said first and second ink layers are of different colors, and the adhesion strength F_1 between the support and the first ink layer and the adhesion strength F_2 between the first and second ink layers satisfy the relations of $F_1 > F_2$ at 90° C. and $F_1 < F_2$ at 40° C. the total ink layers on the support having a tensile strength in the range of 8–20 kg/cm^2.

4,960,633

MICROWAVE-ABSORPTIVE COMPOSITE

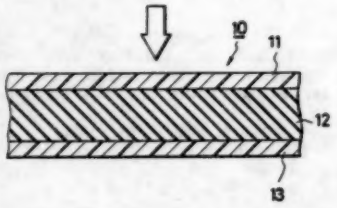
Misao Hiza, Hiratsuka; Hajime Yamazaki, Hadano; Kazuhiro Sugihara, Hiratsuka, and Tetsu So, Hiratsuka, all of Japan, assignors to The Yokohama Rubber Co., Ltd., Tokyo, Japan

Filed Apr. 20, 1987, Ser. No. 39,922

Claims priority, application Japan, Apr. 22, 1986, 61-91280

Int. Cl.[5] B32B *25/02, 25/20, 15/06*

U.S. Cl. 428—215 14 Claims



1. A microwave absorptive composite comprising:

an outermost layer including a fibrous sheet impregnated with a thermosetting resin;

an intermediate layer including a resinous sheet of a normally liquid silicone rubber admixed with carbon black; and

an innermost layer including a thermosetting resin sheet reinforced with at least one of a carbon fiber, metal fiber or wire mesh, a sheet of metal, a sheet of resin containing a particulate metal, and a resinous sheet surface-welded with a metal, said intermediate layer being interposed between said outermost and innermost layers and said layers being laminated together into an integral sheet structure.

4,960,634

EPOXY COMPOSITION OF INCREASED THERMAL CONDUCTIVITY AND USE THEREOF

Christian M. Boyko, Conklin, N.Y.; Craig N. Johnston, Nicholasville, Ky.; James R. Loomis, Binghampton, N.Y.; Carl E. Samuelson, Johnson City, N.Y., and Richard A. Schumacher, Endicott, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 14, 1990, Ser. No. 494,807

Int. Cl.[5] B32B *7/00;* C08K *3/22;* B05D *3/02*

U.S. Cl. 428—220 15 Claims

1. A composition comprising:

(A) about 70 to 90 parts per 100 parts by weight of resin solids of a tetrabrominated diglycidyl ether of a phenol polyepoxide;

(B) about 10 to about 30 parts per 100 parts by weight of resin solids of an epoxy polymer having functionality of about 3.5 to about 6;

(C) about 40 to about 75 parts by weight per 100 parts of resin solids of zinc oxide;

(D) about 3 to about 4 parts per 100 parts by weight of resin solids of dicyandiamide; and

(E) about 0.2 to about 0.4 parts per 100 parts by weight of resin solids of a tertiary amine.

4,960,635

FILM CONSISTING OF ONE OR MORE MONOMOLECULAR LAYERS

Christian Erdelen, Wiesbaden; Helmut Ringsdorf; Werner Prass, both of Mainz, and Ude Scheunemann, Frankfurt am Main, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Sep. 15, 1988, Ser. No. 244,930

Claims priority, application Fed. Rep. of Germany, Sep. 19, 1987, 3731606

Int. Cl.[5] B32B *5/00*

U.S. Cl. 428—220 14 Claims

1. A film consisting essentially of at least one monomolecular layer of an amphiphilic compound, wherein the layer contains an organic polymer having long-chain fluoroalkyl side groups of the formula I

$$CF_3-(CF_2)_n(CH_2)_m- \quad (I)$$

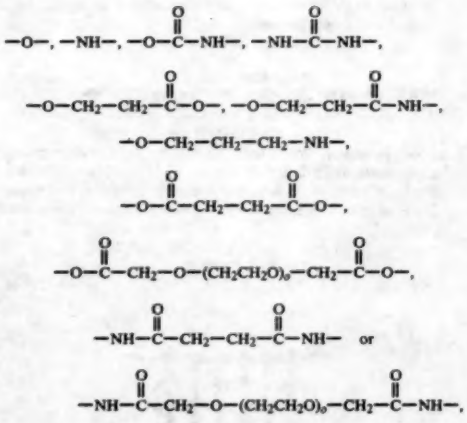
in which n is a number from zero to 23 and m is a number from zero to 24, said side groups being oriented in the same sense, parallel to one another and essentially at right angles to the plane of the layer, said organic polymer having been obtained by free radical polymerization of a monomer of formula II

$$CF_3-(CF_2)_n-(CH_2)_m-X-R^1 \quad (II)$$

in which

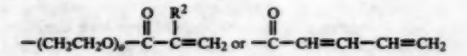
m and n are as defined previously;

X is a radical



o being a number from zero to 10; and

R^1 is a radical



in which o has the abovementioned meaning and R^2 is —H, —CH_3, —CN, —CL or —F.

4,960,636

BIAXIALLY ORIENTED POLYESTER FILM FOR FLOPPY DISK

Kichinojo Tomitaka, Yokohama; Shigeo Utsumi, Yamato, and Masumi Koizumi, Kawasaki, all of Japan, assignors to Diafoil Company, Limited, Tokyo, Japan

Filed Mar. 23, 1990, Ser. No. 497,914
Claims priority, application Japan, Apr. 13, 1989, 64-94146
Int. Cl.[5] C08G *63/02, 63/22;* B32B *3/02*
U.S. Cl. 428—220 2 Claims

1. A biaxially oriented polyester film for floppy disks which has an in-plane thermal expansion coefficient (α_Y) of $(1.7\pm0.8)\times10-5/°$ C. and a shrinkage of not more than 0.03% after 72-hour treatment under the conditions of 60° C. and 80% RH, and which simultaneously satisfies the following relationships (1) to (6):

$$1.492 \leqq n\alpha \leqq 1.505 \quad (1)$$

$$0.160 \leqq \Delta P \leqq 0.168 \quad (2)$$

$$1.605 \leqq \bar{n} \leqq 1.609 \quad (3)$$

$$5 \leqq X_I \leqq 15 \quad (4)$$

$$60 \leqq X_{100} \leqq 68 \quad (5)$$

$$1.395 \leqq \rho \leqq 1.405 \quad (6)$$

wherein $n\alpha$ represents the refractive index of the film in the direction of the thickness, ΔP the degree of planar orientation, $\bar{n}$ the average refractive index, X_I the X-ray diffraction peak ratio, X_{100} the crystal size (A) in the face (100), and ρ the density.

4,960,637

POLYMERIC FILMS

Susan Biczenczuk, Bridgwater, England, assignor to Courtaulds Films & Packaging (Holdings) Ltd., Somerset, England

Filed Nov. 2, 1989, Ser. No. 430,375
Claims priority, application United Kingdom, Nov. 14, 1988, 8825867
Int. Cl.[5] B32B *3/26, 7/02*
U.S. Cl. 428—314.4 12 Claims

1. An oriented polymeric film comprising a base layer of voided polypropylene having a writeable layer thereon, the writeable layer comprising a blend of a first polymer having a melt flow index of not more than 1 g/10 mins under ASTM D1238/73 (conditions L) and at least one polymer chemically incompatible therewith.

4,960,638

RECORDING SHEET

Shunichiro Mukoyoshi, Nishinomiya; Tsunefumi Yamori, Kobe; Shigekazu Shuku, Nara, and Hironari Fujioka, Takatsuki, all of Japan, assignors to Kanzaki Paper Manufacturing Co., Ltd., Tokyo, Japan

Filed Feb. 6, 1989, Ser. No. 306,749
Claims priority, application Japan, Feb. 8, 1988, 63-27011
Int. Cl.[5] B41M *5/00*
U.S. Cl. 428—342 5 Claims

1. A recording sheet which comprises a support base and a recording layer formed thereon by curing, with radiation, a material containing a hydrophilic resin prepolymer curable with radiation, said prepolymer having a polyoxyethylene skeleton represented by the formula:

$$-O-CH_2-CH_2-O-_n$$

wherein n is defined by $10 \leqq n \leqq 150$, and having ethylenic unsaturated groups curable with radiation at both terminals thereof, the coating weight of the recording layer being at least 0.1 g/m^2.

4,960,639

MULTILAYERED CONTAINER

Hidemasa Oda; Tohei Moritani; Satoshi Hirofuji, and Kenji Okuno, all of Kurashiki, Japan, assignors to Kuraray Co., Ltd., Kurashiki, Japan

Filed Feb. 23, 1989, Ser. No. 314,550
Claims priority, application Japan, Feb. 29, 1988, 63-47862
Int. Cl.[5] B32B *5/16*
U.S. Cl. 428—34.5 8 Claims

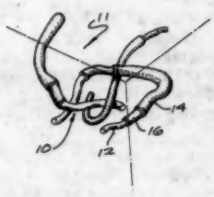
1. A multilayered container comprising a first layer of composition (A) comprising at least one inorganic powder selected from the group consisting of mica, sericite, talc and glass flake in an amount of 5 to 50% by weight of said first layer and a gas barrier resin, and a second layer of composition (B) comprising at least one inorganic powder selected from mica, sericite, talc and glass flake in an amount of 3 to 60% by weight of said second layer and a thermoplastic resin, wherein said gas barrier resin of the first layer is not the same resin as the structural thermoplastic resin of the second layer.

4,960,640

COMPOSITE REFRACTORY MATERIAL

Edward L. Paquette, Claremont, and Marc G. Simpson, Los Angeles, both of Calif., assignors to Refractory Composites, Inc., Whittier, Calif.

Filed Feb. 19, 1988, Ser. No. 157,907
Int. Cl.[5] B32B *9/00*
U.S. Cl. 428—368 24 Claims



1. In combination,
a substrate formed from a plurality of discrete elements having a porous relationship, and
a matrix disposed on the substrate with a minimal chemical and mechanical bonding to the substrate and having a different coefficient of thermal expansion than that of the substrate to provide for changes in position of the matrix relative to the substrate with changes in temperature and with the imposition of mechanical shocks on the substrate, the matrix being formed from an element having refractory properties and selected from the group consisting of hafnium, zirconium, tantalum, tungsten and molybdenum and from another element chemically bonded to the refractory element.

4,960,641

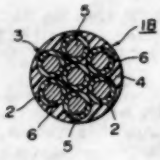
STRANDED INSULATED WIRE

Kazuo Hanaoka; Sueji Chabata; Michio Koike, and Takao Tsuboi, all of Tokyo, Japan, assignors to Fujikura Ltd., Tokyo, Japan

Filed Mar. 9, 1988, Ser. No. 165,847
Int. Cl.[5] B32B *21/00, 21/08;* D02G *3/00*
U.S. Cl. 428—383 6 Claims

1. A stranded insulated wire, comprising:
(a) an assembly of a plurality of enameled strands, each comprising an annealed copper wire or tin-plated annealed copper wire having thereon an insulating coating made of polyvinyl formal, polyester, polyurethane, silicone, epoxy, nylon, phenoxy, polyimide, polyester-imide, polyester-amide-imide, polyhydantoin or polyhydantoin-ester-imide; and

(b) an assembling layer coating over said assembly of enameled strands, said assembling layer being produced by applying a coating material, consisting essentially of about



100 parts by weight of polyvinyl butyral, and about 1 to 1,000 parts by weight of a stabilized polyisocyanate, to the assembly and then baking said coating material to effect crosslinking.

4,960,642

PELLETS FOR MAKING ELECTROMAGNETIC WAVE SHIELDING MATERIAL AND METHOD FOR MANUFACTURING THE SAME

Izumi Kosuga, Yokohama; Kenichi Otani, Hiratsuka, and Kazuaki Matsumuto, Hikone, all of Japan, assignors to The Furukawa Electric Co., Ltd., Tokyo, Japan

PCT No. PCT/JP87/00246, § 371 Date Dec. 15, 1987, § 102(e) Date Dec. 15, 1987, PCT Pub. No. WO87/06178, PCT Pub. Date Oct. 22, 1987

PCT Filed Apr. 17, 1987, Ser. No. 163,962

Claims priority, application Japan, Apr. 17, 1986, 61-86999; Dec. 19, 1986, 61-301462

Int. Cl.[5] B32B *5/16, 15/02, 27/04*

U.S. Cl. 428—407 **5 Claims**

1. Pellets for making shielding electromagnetic wave material, comprising:

conducting fibers selected from the group consisting of stainless steel fibers and copper fibers, said fibers having a diameter of 4 to 100 μm and a length of 6 to 10 mm;

a thermoplastic resin oligomer having a viscosity of not more than 10,000 centipoises when melted, and impregnated into said conductive fibers, thus forming an integral unit, the weight ratio between said thermoplastic resin oligomer and said conductive fibers being 5:95 to 30:70; and

a thermoplastic resin coated on the outside of said unit, said resin being compatible with said resin oligomer, the weight ratio of said conductive fibers to said thermoplastic resin coating being 3:97 to 70:30.

4,960,643

COMPOSITE SYNTHETIC MATERIALS

Jerome H. Lemelson, 48 Parkside Dr., Princeton, N.J. 08540

Filed Mar. 31, 1987, Ser. No. 32,352

Int. Cl.[5] B32B *9/04, 15/04;* **F16C** *13/02;* **C10M** *103/00*

U.S. Cl. 428—408 **22 Claims**

1. A composite article of manufacture comprising:

(a) a core formed of a hard, high strength solid material selected from the group consisting of diamond; synthetic diamond; amorphous carbon; graphite; a metal; a metal alloy; carbides, nitrides and oxides of tungsten, boron, titanium, zirconium, aluminum and chromium,

(b) a thin layer of synthetic diamond-like material contiguously disposed, on the surface of said core and being bonded thereto,

(c) said thin layer of synthetic diamond-like material being disposed completely around and forming an uninterrupted protective coating which completely surrounds said core,

(d) a further layer of lubricating material contiguously disposed on said thin layer.

4,960,644

AQUEOUS ADDITIVE SYSTEMS, METHODS AND POLYMERIC PARTICLES

Kenneth W. Hyche, and William C. Gose, both of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 97,026, Sep. 16, 1987, Pat. No. 4,880,470, and a continuation-in-part of Ser. No. 701,888, Feb. 15, 1985, abandoned. This application Jul. 12, 1989, Ser. No. 364,758

Int. Cl.[5] B32B *5/16, 9/00*

U.S. Cl. 428—407 **6 Claims**

1. A method of applying additives to polymeric particles comprising contacting said particles with an aqueous system characterized by freedom from in situ formation of color producing complexes, said system comprising about 2 to about 10 percent by weight of a surfactant, about 5 to about 20 percent by weight of an emulsified wax, about 0.2 to about 1.0 percent by weight of a base with a pH in the range of greater than 7 to equal to or less than 10.5, about 20 to about 60 percent by weight of at least one additive capable of forming color producing complexes, and about 40 to about 60 percent by weight of water; and thereafter drying said particles.

4. Polymeric particles treated by the method of claim 1.

4,960,645

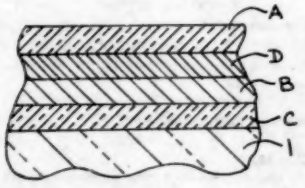
HEAT TREATABLE SPUTTER-COATED GLASS

Philip J. Lingle, Lambertville, Raymond Nalepka, Westland, both of Mich., assignor to Guardian Industries Corp., Northville, Mich.

Filed Oct. 10, 1989, Ser. No. 418,959

Int. Cl.[5] B32B *17/06*

U.S. Cl. 428—432 **26 Claims**



1. A heat treatable article comprising:

(a) a glass substrate having thereon;

(b) a coating system consisting essentially of a metallic layer selected from nickel or a nickel alloy having at least 50% by weight nickel and as an overcoat therefor, a layer consisting essentially of tin oxide wherein said article is durable and is capable of withstanding temperatures of from about 1150°–1450° F. for times sufficient to bend, heat strengthen or temper said article.

4,960,646

TITANIUM COMPOSITE MATERIALS COATED WITH CALCIUM PHOSPHATE COMPOUND

Takayuki Shimamune, Tokyo, and Masashi Hosonuma, Kanagawa, both of Japan, assignors to Permelec Electrode Ltd., Kanagawa, Japan

Division of Ser. No. 29,519, Mar. 24, 1987, Pat. No. 4,882,196.
This application Apr. 17, 1989, Ser. No. 338,791
Claims priority, application Japan, Mar. 24, 1986, 61-64012; Mar. 24, 1986, 61-64013; Mar. 28, 1986, 61-70504
Int. Cl.[5] B32B *15/04*
U.S. Cl. 428—471 4 Claims

1. A titanium composite material comprising a titanium or titanium alloy substrate, a base layer formed thereon of a calcium phosphate compound resulting from calcination of a hydrochloric or nitric acid aqueous solution of the calcium phosphate compound, and a covering thereon of a calcium phosphate compound formed by sintering a suspension of the calcium phosphate compound applied to the base layer.

4,960,647

PROCESS FOR THE REACTIVE TREATING OF PALLADIUM TO FORM A PROTECTIVE COATING AND ARTICLE

James Grundy, San Diego, Calif., assignor to Johnson Matthey Inc., Valley Forge, Pa.

Filed May 22, 1989, Ser. No. 360,841
Int. Cl.[5] C23C *22/05*
U.S. Cl. 428—472.1 6 Claims

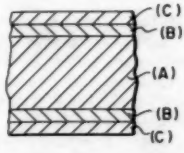
1. Palladium metal or a palladium alloy the surface of which has been treated with boric acid by wetting the surface of the metal or alloy with an aqueous solution consisting essentially of boric acid and then heating the thus wetted metal or alloy until a ceramic-like surface is formed, said surface being less susceptible to oxidation than the metal or alloy surface before said treatment with boric acid.

4,960,648

LAMINATED MATERIALS AND LAMINATED ARTICLES

Toyokazu Yamada, Himeji, Japan, assignor to Idemitsu Petrochemical Company Limited, Tokyo, Japan

Filed Apr. 12, 1989, Ser. No. 336,281
Claims priority, application Japan, Apr. 14, 1988, 63-92562; Apr. 14, 1988, 63-92563
Int. Cl.[5] B32B *27/08*
U.S. Cl. 428—476.3 9 Claims



1. A laminated material comprising:

a resin composition layer (A) comprising a thermoplastic resin and an inorganic filler, said inorganic filler being in a scaly or non-scaly form and in an amount from 20% to 80% by weight of the total weight of the thermoplastic resin and the inorganic filler;

a resin composition layer (B) comprising a thermoplastic resin and an inorganic filler, said inorganic filler being in an amount from 30% to 70% by weight of the weight of the inorganic filler contained in said resin composition layer (A), said inorganic filler being in a scaly form when the inorganic filler contained in the resin composition layer (A) is in a scaly form or being in a non-scaly form when the inorganic filler contained in the resin composition layer (A) is in a non-scaly form; and

a plastic resin layer (C);

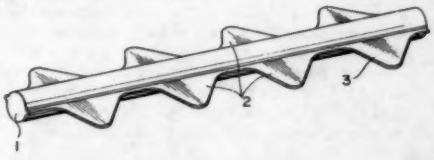
in which said resin composition layer (B) is interposed between said resin composition layer (A) and said thermoplastic resin layer (C).

4,960,649

REINFORCING METAL FIBERS

Susumu Takata, and Mamoru Murahashi, both of Kobe, Japan, assignors to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

Continuation of Ser. No. 126,760, Nov. 30, 1987, abandoned.
This application Jan. 29, 1990, Ser. No. 471,062
Int. Cl.[5] C04B *14/48*
U.S. Cl. 428—574 3 Claims



1. A metal fiber to be mixed in a refractory material, which comprises:

a longitudinal strength body having at least a radially extending cross-sectional configuration so as to form at least one substantially annular surface portion in cross-section along the entire length of said body and so as to define the thickness dimension of said body;

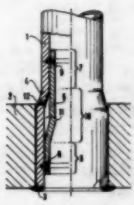
a plurality of fins extending laterally in a first and second row positioned on opposite sides, respectively, of said strength body so as to define the width dimension of said body, said fins extending continuously along the length of said body wherein the ratio of a maximum width of the metal fiber to a maximum thickness of the metal fiber is in the range of 2.5 to 6.

4,960,650

METHOD OF REPAIRING OR PROTECTING AN END OF A METAL TUBE IN A HEAT EXCHANGER AND SLEEVE FOR IMPLEMENTING SAME

Gilbert Vigneron, Boulogne sur Seine; Jean Bezier, Croix; Thong Nguyen-Thanh, Cernay la Ville; Pierre Vidal, Montigny sur Loing; Guy Zacharie, Fontainebleau, and Lucien Guillemin, Bagneaux sur Loing, all of France, assignors to Societe Anonyme, Villacoublay and Electricite De France, Paris, both of, France

Continuation of Ser. No. 123,476, Nov. 20, 1987, abandoned.
This application Jun. 15, 1989, Ser. No. 366,362
Claims priority, application France, Nov. 21, 1986, 86 16231
Int. Cl.[5] F16L *55/16;* F28F *11/02*
U.S. Cl. 428—594 13 Claims



1. A method for repairing or protecting a damaged or corroded area of the end of a metal heat exchanger tube near the inside surface of its tube sheet, comprising:

inserting a metal sleeve having an outside diameter slightly smaller than the tube's inside diameter into the tube to a sufficient depth to cover the damaged or corroded area, locally radially expanding the end of the sleeve towards the outside of the tube sheet against the tube, locally welding the end of the sleeve towards the outside surface of the tube sheet axially inwards from the end thereof and the corresponding end of the tube, and

thereafter, expanding the end portion of the sleeve above the local weldment in the region located on the inside of the tube sheet thereby providing a fluid tight barrier between the local weldment and said damaged or corroded area and thereby removing the region affected by the weld from the corrosive action of the fluid flowing around the tube, and wherein the weld being axially inwards of the end of the sleeve allowing greater flexibility in height adjustment of a welding torch in making such welds by automatic inert gas shield are welding, and expanding and engaging the end of the sleeve against the tube wall beyond the damaged or corroded area thereof, then locally welding the engaged end of the sleeve beyond the damaged or corroded area to the inside of the tube such that the tube is partially penetrated by the weld.

4,960,651

MAGNETIC DEVICES

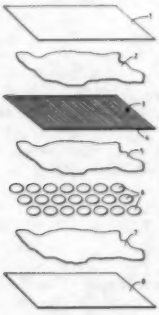
Robert M. Pettigrew, Foxton; Stephen H. Chambers, Willingham, and Dafydd G. Davies, Cambridge, all of United Kingdom, assignors to Scientific Generics Limited, King's Court, United Kingdom

Filed Jun. 7, 1988, Ser. No. 203,123

Claims priority, application United Kingdom, Jun. 8, 1987, 8713353; Dec. 29, 1987, 8730237; May 26, 1988, 8812500

Int. Cl.[5] G08B *13/26*

U.S. Cl. 428—607 **57 Claims**



50. An antipilferage tag which comprises a substrate and a thin coating of a magnetic material,:

(a) said substrate being a flexible, laminar polymer material;

(b) said magnetic material being an amorphous metal glass of high intrinsic magnetic permeability, with low or substantially zero magnetostriction, and with low coercivity;

(c) said thin coating of a magnetic material being no greater than 6 microns in thickness;

(d) said substrate having a primary axis defining the major dimension of the substrate and a real or notional secondary axis perpendicular to said primary axis and located so as to pass through the mid point of said primary axis;

(e) the ratio between the dimensions of said substrate measured along said primary axis and said secondary axis being no greater than 3:1; and

(f) the tag further including a deactivation layer of zone(s) adjacent to said thin coating.

4,960,652

GRAIN-ORIENTED ELECTRICAL STEEL SHEET HAVING A LOW WATT LOSS

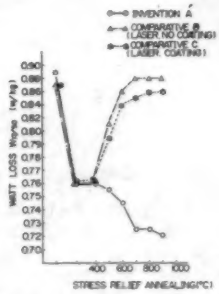
Toshiya Wada; Osamu Tanaka; Takatoshi Egawa; Makato Yoshida; Seizun Higuchi, and Teruaki Izaki, all of Kitakyushu, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Continuation of Ser. No. 946,963, Dec. 29, 1986, abandoned, which is a continuation-in-part of Ser. No. 786,616, Oct. 11, 1985, abandoned. This application Jan. 22, 1990, Ser. No. 470,997

Claims priority, application Japan, Oct. 15, 1984, 59-215823; Nov. 6, 1984, 59-232394; Nov. 12, 1984, 59-236641; Nov. 13, 1984, 59-237446; Dec. 13, 1984, 59-261685; Feb. 9, 1985, 60-22762; Feb. 13, 1985, 60-24427; Apr. 18, 1985, 60-81433

Int. Cl.[5] H01F *1//16*

U.S. Cl. 428—611 **6 Claims**



1. A grain-oriented electrical steel sheet having an ultra low watt loss and exhibiting heat-resistant subdivision of magnetic domains, comprising:

said steel sheet having a predetermined silicon steel composition and a structure determined by finish annealing and an insulating coating on the surface thereof;

said steel sheet having thereon plastic strain regions which are spaced apart at a distance of 1 to 30 mm; and

intruder means for subdividing said magnetic domains upon magnetization of said steel sheet and for causing said subdivided magnetic domains to be heat resistant, said intruder means being thermally diffused into said steel at locations wherein the locations of said diffused intruder means in said steel sheet are limited to said spaced apart regions of plastic strain, said diffused intruders being thereby spaced apart at said distance of 1 to 30 mm corresponding to said plastic strain regions; said intruder means maintaining said subdivided magnetic domains after relief annealing is carried out whereby said electrical steel sheet has a $W_{17/50}$ watt loss of from 0.64 to 0.92 (watt/kg) at a sheet thickness of from 0.18 to 0.30 mm after relief annealing is carried out.

4,960,653

METHOD OF COPPER-NICKEL-CROMIUM BRIGHT ELECTROPLATING WHICH PROVIDES EXCELLENT CORROSION RESISTANCE AND PLATING FILM OBTAINED BY THE METHOD

Hiroshi Yokoi, Odawara, Japan, assignor to Kanto Kasei Co., Ltd., Yokosuda, Japan

Filed Nov. 30, 1989, Ser. No. 444,081

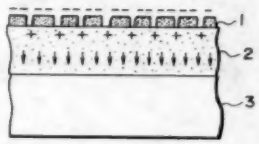
Int. Cl.[5] C25D *5/12*

U.S. Cl. 428—613 **2 Claims**

1. In a method of copper-nickel-chromium electroplating or in a method of nickel-chromium electroplating, a method of copper-nickel-chromium bright electroplating which provides excellent corrosion resistance, characterized in that after applying a nickel plating; using a bath prepared by the addition of

0.5–20 g/l of calcium salt with a particle diameter of 0.1–10 μm, and 0.5–10 g/l of titanium oxide with a particle diameter of 0.1–4 μm to a Watts bath type of nickel plating bath, codeposit plating of 0.2–2 μm in thickness is applied; and then 0.01–0.25 μm of chromium plating is applied to form micropores with a pore number of 20000–500000/cm^2.

2. In a copper-nickel-chromium electroplating or in a nickel-chromium electroplating, a copper-nickel-chromium bright electroplating film being excellent in corrosion resistance,



characterized in that said bright electroplating film comprised copper and nickel plating layers formed on a basis material or a nickel plating layer directly formed on a basis material; a microporous layer of a thickness of 0.2–2 μm codeposited on said nickel plating layer by adding calcium salt and titanium oxide to a Watts bath type of nickel plating bath; chromium plating layer with a thickness of 0.01–0.25 μm on said microporous layer; said chromium plating surface having micropores of 20000–500000/cm^2.

4,960,654

METAL COMPOSITION COMPRISING ZINC OXIDE WHISKERS

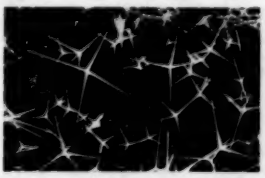
Minoru Yoshinaka; Eizo Asakura; Mitsumasa Oku, all of Osaka; Takeshi Hamabe, Nishinomiya; Motoi Kitano, Kawanishi, and Hideyuki Yoshida, Amagasaki, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Filed Aug. 29, 1989, Ser. No. 399,937

Claims priority, application Japan, Aug. 29, 1988, 63-214008; Aug. 29, 1988, 63-214009

Int. Cl.^{5} C22C *32/00*

U.S. Cl. 428—614 **18 Claims**



1. A metal composition which comprises a mixture of a metal and whiskers of zinc oxide dispersed in the metal matrix, each zinc oxide whisker having at least one needle crystal which includes a basal part having a diameter of from 0.7 to 14 micrometers and having a length from the basal part to the tip of from 3 to 200 micrometers.

4,960,655

LIGHTWEIGHT BATTERIES

Henry F. Hope, and Stephen F. Hope, both of 5701 Moreland Rd., Willow Grove, Pa. 19090

Filed Jan. 27, 1989, Ser. No. 302,622

The portion of the term of this patent subsequent to Dec. 27, 2005, has been disclaimed.

Int. Cl.^{5} H01M *6/18*

U.S. Cl. 429—192 **21 Claims**

1. In a battery of the alkaline or alkaline earth metal type which includes an anode, a polymer dielectric layer, a cathode, and having current collection and carrying base means which comprises

a base current collector and carrier of carbon or graphite and

a coating on said base.

4,960,656

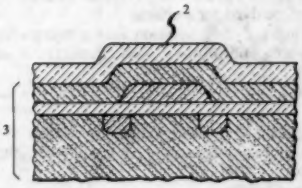
DEVICES AND PROCESS FOR PRODUCING DEVICES CONTAINING SILICON NITRIDE FILMS

Chorng-Ping Chang, Berkeley Heights; Daniel L. Flamm, Chatham Township, Morris County; Dale E. Ibbotson, Westfield, and John A. Mucha, Madison, all of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Continuation of Ser. No. 287,576, Dec. 15, 1988, abandoned, and a continuation of Ser. No. 9,789, Feb. 2, 1987, abandoned. This application Dec. 12, 1989, Ser. No. 449,467

Int. Cl.^{5} B32B *9/04*

U.S. Cl. 428—704 **23 Claims**



1. A process for fabricating a device including an insulating material, said process comprising the steps of forming a region of said device and depositing a silicon nitride insulating material on said region by maintaining a discharge in a gas comprising (1) a source of reactive nitrogen, (2) a source of reactive fluorine, (3) a source of silicon including at least one silicon-containing compound having less than half the silicon bonding orbitals satisfied by fluorine moieties, and (4) a source of a substantial level of reactive hydrogen, while interacting the species from said discharge with said region to deposit a silicon nitride layer having a resistivity in the range of 10^{14} to 10^{16} ohm centimeters.

4,960,657

LITHIUM CELLS

Yoshitomo Masuda, Tachikawa; Masao Ogawa, Kawagoe; Katsuhiko Arai, Iruma; Kinya Suzuki; Tadashi Fuse, both of Kodaira, and Tetsuro Amano, Tokyo, all of Japan, assignors to Bridgestone Corporation, Tokyo, Japan

Filed Feb. 21, 1989, Ser. No. 312,914

Claims priority, application Japan, Mar. 1, 1988, 63-48419; Mar. 1, 1988, 63-48420; Mar. 10, 1988, 63-57016; Jan. 24, 1989, 1-14432

Int. Cl.^{5} H01M *6/14*

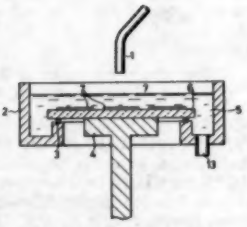
U.S. Cl. 429—194 **2 Claims**

1. In a lithium cell comprising a negative electrode containing lithium, a positive electrode, and an electrolyte disposed between the positive and negative electrodes, the improvement wherein said negative electrode has a coating thereon obtained by surface treating the negative electrode by contacting the negative electrode with a moist gas containing water in an amount of 0.3 to 50% by weight.

4,960,658
COLOR FILTER DYEING APPARATUS

Masahiko Ikeno, and Hideo Saeki, both of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 941,042, Dec. 12, 1986, Pat. No. 4,821,675. This application Oct. 21, 1988, Ser. No. 260,870
Claims priority, application Japan, Dec. 16, 1985, 60-282576
Int. Cl.[5] G03F *9/00*
U.S. Cl. 430—7 **27 Claims**



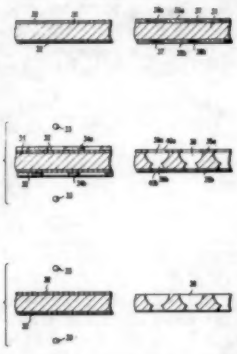
1. A method for drying a color filter on the surface of a substrate, comprising the steps of:
applying at least one substrate comprising a photosensitive filter to be dyed on a chuck;
introducing a dyeing solution into a receptacle container comprising said substrate, said chuck, and a sealing member;
monitoring at least one temperature sensor in said receptacle;
transmitting a first electrical signal from said sensor to a temperature control unit in response to the temperature of said dyeing solution;
transmitting a second electrical signal indicative of an on/off command from said temperature control unit to at least one heater located in said receptacle;
maintaining a predetermined temperature range of said dyeing solution;
soaking said substrate in said dyeing solution;
discharging said dyeing solution from said receptacle; and
removing said substrate from said receptacle.

4,960,659
METHOD FOR PREPARING A SHADOW MASK FOR A COLOR PICTURE TUBE

Seiji Sagou, Saitama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jan. 13, 1989, Ser. No. 296,809
Claims priority, application Japan, Jan. 27, 1988, 63-014509
Int. Cl.[5] G03C *5/04*
U.S. Cl. 430—23 **6 Claims**

1. A method for preparing a shadow mask having a plurality of apertures permitting the passage of electron beams emitted from an electron gun of a color picture tube from a metal shadow mask sheet, comprising the steps of:
providing a first and second photosensitive layers on first and second surfaces of the shadow mask sheet, respectively;
exposing the first photosensitive layer on the first surface of the sheet to a first patterned light and the second photosensitive layer on the second surface of the sheet to a second patterned light, the exposing being executed till respective accumulated exposure amount of the exposure to the first and second patterned light reaches predetermined value,
exposing the entire surface of at least one of the first and second photosensitive layers to an unpatterned light, the exposing being executed till the accumulated exposure amount of the exposure to the unpatterned light reaches prescribed value smaller than the predetermined value, and
removing portions of the first and second photosensitive layers unexposed by the first and second patterned light

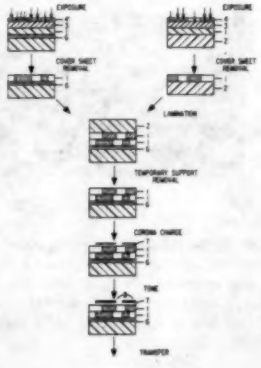


to leave resist films on the first and second surfaces, respectively;
etching the sheet for removing a portion of each recess to form the apertures; and
removing the remaining portions of the resist films.

4,960,660
HIGH RESOLUTION SUPERIMPOSED IMAGES FROM PHOTOPOLYMER ELECTROGRAPHIC MASTER

Alan S. Dubin, Greenville; Catharine E. Looney, Wilmington, both of Del., and Steven P. Schmidt, Chester Springs, Pa., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Mar. 31, 1989, Ser. No. 331,487
Int. Cl.[5] G03G *13/28, 13/01*; G03C *1/725*
U.S. Cl. 430—49 **30 Claims**



1. A process for the preparation of high resolution images comprising
(A) exposing a photopolymerizable electrographic element comprising in order; a conductive support, a first photopolymerizable layer and a strippable cover sheet, imagewise to actinic radiation through the cover sheet;
(B) stripping the cover sheet from the imagewise exposed photopolymerizable layer;
(C) laminating to the surface of the imagewise exposed photopolymerizable layer a photopolymerizable element

comprising an imagewise exposed photopolymerizable layer on a temporary surface, the two photopolymerizable layers in contact;

(D) peeling off the temporary surface from the exposed photopolymerizable layer;

(E) charging electrostatically the exposed photopolymerizable layers; and

(F) developing the electrostatically charged exposed image with a first developer.

4,960,661

ELECTROPHOTOGRAPHIC LITHOGRAPHIC PRINTING PLATE PRECURSOR

Eiichi Kato, and Kazuo Ishii, both of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jan. 30, 1989, Ser. No. 303,220

Claims priority, application Japan, Jan. 28, 1988, 63-15847; Feb. 2, 1988, 63-21354

Int. Cl.[5] G03G *5/087*

U.S. Cl. 430—49 **13 Claims**

1. An electrophotographic lithographic printing plate precursor comprising a conductive support having provided thereon at least one photoconductive layer containing photoconductive zinc oxide and a resin binder, wherein said resin binder comprises (A) at least one resin containing at least one functional group capable of forming at least one carboxyl group upon decomposition upon treatment with an oil-desensitizing solution or dampening water and at least one of (B) a heat-curable or a photo-curable resin, and (C) a cross-linking agent.

4,960,662

POSITIVELY AND NEGATIVELY CHARGEABLE ELECTROPHOTOGRAPHIC PHOTORECEPTOR

Masayuki Nishikawa; Yumiko Komori; Masaki Yokoi; Masato Ono; Noriyoshi Takahashi; Yuzuru Fukuda; Shigeru Yagi, and Ken-ichi Karakida, all of Kanagawa, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Jan. 5, 1989, Ser. No. 293,843

Claims priority, application Japan, Jan. 8, 1988, 63-001357

Int. Cl.[5] G03G *5/085*

U.S. Cl. 430—64 **5 Claims**

1. A positively and negatively chargeable electrophotographic photoreceptor comprising a substrate having thereon a charge blocking layer, an amorphous silicon photoconductive layer and a nitrided amorphous silicon layer provided in that order, wherein said charge blocking layer has a thickness of from 0.1 to 5 microns and a ratio of nitrogen to silicon by atom of from 0.4 to 1.2, said amorphous silicon photoconductive layer has a thickness of from 5 to 50 microns and comprises an i-type amorphous silicon having a boron content of from 0.05 to 5.0 ppm, and said nitrided amorphous silicon surface layer has a thickness of from 0.1 to 5 microns and a ratio of nitrogen to silicon by atom of from 0.6 to 1.2.

4,960,663

PERSISTENT PHOTOCONDUCTIVE COATING COMPOSITION

Ken-ichi Shimazu, Briarcliff Manor, N.Y.; Jayanti Patel, Fairlawn, N.J., and Jill Tolfree, Yonkers, N.Y., assignors to Polychrome Corporation, Yonkers, N.Y.

Filed Feb. 27, 1989, Ser. No. 322,650

Int. Cl.[5] G03G *5/09*

U.S. Cl. 430—70 **24 Claims**

1. A persistent photoconductive coating composition comprising a persistent photoconductive effective amount of a persistent photoconductor, photoinitiator and an acetate or phenolic hydroxyl containing resin dispersed in an inert, coherent matrix.

4,960,664

DEVELOPER COMPOSITION FOR DEVELOPING ELECTROSTATIC IMAGE AND TONER IMAGE FORMING PROCESS

Hiroyuki Yamada, Fujisawa; Hiroyuki Takagiwa; Hiroya Masaki, both of Hachioji; Takahira Kasuya, Hino; Jiro Takahashi, Sagamihara; Masafumi Uchida, Hachioji, and Satoru Ikeuchi, Hino, all of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 79,636, Jul. 30, 1987, abandoned. This application Sep. 25, 1989, Ser. No. 412,551

Claims priority, application Japan, Jul. 31, 1986, 61-178962; Jul. 31, 1986, 61-178964

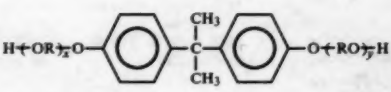
Int. Cl.[5] G03G *9/10*

U.S. Cl. 430—109 **10 Claims**

1. A developer composition for developing an electrostatic latent image comprising:

(1) a color toner comprising (i) a polyester resin obtained by polymerizing by condensation polymerization:

(a) a mixture of diol components comprising diols represented by the formula (1):

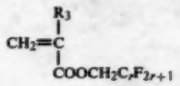


(1)

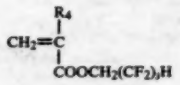
wherein R is an ethylene group or a propylene group, x and y represent integers and the average of the total sum of x and y is from 2 to 7, and

(b) a mixture of acid components comprising an aliphatic unsaturated dicarboxylic acid, an acid anhydride thereof or a derivative thereof and a polybasic carboxylic acid having not less than three carboxylic acid groups or an acid anhydride thereof, the proportion of the content of said polybasic carboxylic acid having not less than three carboxylic acid groups or the acid anhydride thereof to the total acid components being from 5 mol % to less than 30 mol %, and (ii) a chromatic coloring agent; and

(2) a resin coated carrier comprising a core material and a resin layer coated thereon, said resin layer containing a vinylidene fluoride/ethylene tetrafluoride copolymer and a polymer having at least one of monomer components represented by the following formulas I and II:



Formula I



Formula II

wherein R_3 and R_4 each represent a hydrogen atom or a methyl group, r represents 1 or 2, and s represents an integer of 2 to 4.

4,960,665

TONER AND DEVELOPER COMPOSITIONS CONTAINING ADDITIVES WITH CERTAIN MORPHOLOGIES

Fred A. Elder, Webster; Geoffrey M. T. Foley, Fairport, and William L. Goffe, Webster, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Feb. 27, 1989, Ser. No. 316,193

Int. Cl.[5] G03G *9/097, 13/22*

U.S. Cl. 430—110 **40 Claims**

1. A toner composition comprised of resin particles, and a

component with a sponge, or non-flake like morphology selected from the group consisting of metal salts, of fatty acids, and mixtures thereof.

4,960,666

TONER AND DEVELOPER COMPOSITIONS WITH POLYSILYLENES

Ronald J. Wezgley, Albuquerque, N. Mex.; Timothy J. Fuller, West Henrietta, and Michael J. Levy, Webster, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Feb. 27, 1989, Ser. No. 316,069
Int. Cl.[5] G03G *9/08, 9/12*
U.S. Cl. 430—109 **35 Claims**

1. A toner composition comprised of polysilylenes, poly(germylenes), or mixtures thereof, and pigment particles.

4,960,667

POSITIVELY CHARGED BLACK LIQUID ELECTROPHOTOGRAPHIC DEVELOPER COMPOSITIONS

Raymond W. Wong, Mississauga; Stephan Drappel, Toronto, and Melvin D. Croucher, Oakville, all of Canada, assignors to Xerox Corporation, Stamford, Conn.

Filed Jun. 6, 1988, Ser. No. 202,347
Int. Cl.[5] G03G *9/12*
U.S. Cl. 430—114 **17 Claims**

1. A positively charged liquid developer composition comprised of a hydrocarbon, toner particles consisting essentially of a resin and laked carbon black particles, and a charge director.

4,960,668

MAGNETIC TONER FOR ELECTROPHOTOGRAPHY

Toshihiko Yoshitomi, Yokohama; Heihachi Yushina, Machida; Hiromi Horiuchi, Tokyo; Yukio Yamaguchi, Kawasaki; Yasuo Kamoshita, Yokohama, and Kiyoshi Sekihara, Tsukui, all of Japan, assignors to Mitsubishi Kasei Corporation, Tokyo, Japan

Continuation of Ser. No. 51,924, May 19, 1987, abandoned. This application Dec. 5, 1989, Ser. No. 449,283
Claims priority, application Japan, May 22, 1986, 61-117966
Int. Cl.[5] G03G *13/09*
U.S. Cl. 430—122 **20 Claims**

1. A method of developing a latent electrostatic image on an amorphous silicon photoreceptor comprising contacting said photoreceptor with a specific magnetic toner which comprises a magnetic powder, a negative charge control agent, a binder resin and a compound having a phenazine ring.

4,960,669

PROCESS FOR PRODUCING TONER BY GENERATING NON-SOLUBLE CATIONIC INORGANIC PARTICLES IN DISPERSANT MEDIUM

Hiromi Mori, and Reiko Morimoto, both of Yokohama, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 2, 1988, Ser. No. 279,075
Claims priority, application Japan, Dec. 8, 1987, 62-308531
Int. Cl.[5] G03G *9/087*
U.S. Cl. 430—137 **25 Claims**

1. A process for producing toner for developing electrostatic latent images, comprising the steps of:

dispersing an anionic inorganic dispersant in an aqueous phase;

generating cationic inorganic particles comprising metal hydroxides in said aqueous phase from a water-soluble compound with stirring in order to produce a dispersant medium in which said anionic inorganic dispersant and said cationic inorganic particles coexist, said cationic inorganic particles having a solubility of at most 0.1 g in 100 g of 25° C. water;

dispersing a monomer composition comprising a polymerizable vinyl monomer and a cationic material into said dispersant medium such that particles of said monomer composition are generated; and

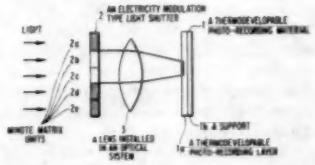
suspension polymerizing said monomer composition particles in order to produce said toner.

4,960,670

FORMULATION OF BARCODEIN MICROENCAPSULATED DIAZO THERMODEVELOPABLE PHOTO-RECORDING METHOD UTILIZING ELECTRIC CURRENT ACTIVATED MINUTE MATRIXES TO LIGHT RECORD

Koutaro Nakamura, Shizuoka, and Yoshiro Kawashima, Tokyo, both of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed May 12, 1988, Ser. No. 193,447
Claims priority, application Japan, May 13, 1987, 62-117429
Int. Cl.[5] G03C *1/76, 1/52*
U.S. Cl. 430—138 **1 Claim**



1. A process for the preparation of a bar-code label or ID card recorded with a bar code using a thermodevelopable photo-recording material comprising a support having thereon a thermodevelopable photo-recording layer containing at least a microencapsulated photodecomposable diazo compound and a coupler capable of reacting with the diazo compound to form color, said diazo compound and coupler being present in sufficient quantity to form a color image upon processing, and a protective transparent film provided on the photo-recording layer comprising the steps of imagewise exposing said photo-recording layer to light through an image to be copied constituted with minute matrixes which come to be able to transmit light or come to be unable to transmit light when electric current is passed therethrough to decompose the diazo compound in the exposed portions of the photo-recording layer, and then heating said photo-recording material to form a color image in the unexposed portions of the photo-recording layer such that a bar code is obtained.

4,960,671

STABILIZED PHOTOSENSITIVE SCREEN PRINTING DISPERSION COMPOSITION WITH DIAZO CONDENSATE, POLYVINYL ALCOHOL, AND COPOLYMER OF VINYL ACETATE AND N-METHYLOC ACRYLAMIDE

Peter Dickinson, 11,Knights Avenue, Broadstairs, Kent, England

Continuation of Ser. No. 131,036, Dec. 8, 1987, abandoned, which is a continuation of Ser. No. 795,346, Oct. 30, 1985, abandoned. This application Nov. 22, 1989, Ser. No. 440,311
Claims priority, application United Kingdom, Mar. 2, 1984, 8405549; PCT Int'l Appl., Mar. 1, 1985, PCT/GB85/00086
Int. Cl.[5] G03F *7/016;* G03C *1/60*
U.S. Cl. 430—175 **1 Claim**

1. A one pot screen printing composition having improved shelf life; said composition comprising:

a. a stabilized aqueous dispersion of a cross-linking agent which is a water insoluble addition copolymer of vinyl acetate and N-methylol acrylamide, said N-methylol acrylamide being present in an effective amount for cross-linking with polyvinyl alcohol;

b. polyvinyl alcohol in an amount which is effective to stabilize said water insoluble copolymer dispersion;

c. a photosensitizer which is a condensation product of an aromatic diazo compound with an acid condensable active carbonyl compound in an amount which is effective to first insolublize the polyvinyl alcohol upon exposure to actinic radiation without cross-linking occurring between the hydroxy and N-methylol functionalities;

said vinyl acetate/N-methylol acrylamide cross-linking copolymer and polyvinyl alcohol being present in separate phases whereby the shelf life is extended in the presence of the cross-linking agent contained in the composition and wherey said separate phases inhibit an acid induced reaction between the hydroxy functionalities of the polyvinyl alcohol and the N-methylol groups as the diazo compound produces acid upon exposure to actinic radiation;

said composition being free of non-aqueous solvent.

4,960,672

SILVER HALIDE PHOTOGRAPHIC MATERIAL

Hisashi Okada, and Kazunobu Katoh, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

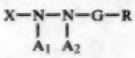
Filed May 3, 1989, Ser. No. 346,707

Claims priority, application Japan, May 6, 1988, 63-110051

Int. Cl.[5] G03C *1/06*

U.S. Cl. 430—264 **10 Claims**

1. A silver halide photographic material comprising a support having thereon at least one of silver halide photographic emulsion layers and other hydrophilic colloidal layers, wherein said photographic emulsion layers or other hydrophilic colloidal layers contain a compound represented by the formula (I):



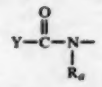
(I)

wherein at least one of A_1 and A_2 represent a hydrogen atom and the other represents a hydrogen atom, a sulfinic residual group, or

wherein R_0 represents an alkyl group, alkenyl group, aryl group, alkoxy group or aryloxy group, and l_1 represents an integer of 1 or 2; G represents

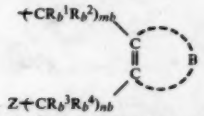
wherein m_1 represents an integer of 1 or 2, sulfonyl group, sulfoxy group,

wherein R_1 represents an alkoxy group or aryloxy group, a thiocarbonyl group or an iminomethylene group; X represents an aliphatic group, an aromatic group or heterocyclic group, substituted by a formula (a):



(a)

wherein Y represents a hydrogen atom, aliphatic group, an aromatic group or heterocyclic group, and Ra represents a hydrogen atom, aliphatic group or aromatic group; and R represents a group represented by formula (b):



(b)

wherein R_b^1 to R_b^4 may be the same or different and each represents a hydrogen atom, an aliphatic group or an aromatic group, B represents a suitable atomic group for forming a 5- or 6-membered ring; Z represents a group capable of making nucleophilic attack on G to separate the —G—R portion from the other protion of the molecule; mb represents an integery 0 or 1; nb represents in integer of 1 when Z is a hydroxy group, or nb represents 0 or 1 when Z is otherwise; and (m_b+n_b) represents an integer of 1 or 2, with the proviso that the sum of the number of carbon atoms contained in X, G and R is 17 or more.

4,960,673

PHOTOPOLYMERIZABLE LAMINATE SUITABLE FOR PRODUCING PRINTING PLATES

Erich Beck, Harthausen; Bernd Bronstert, Otterstadt; Wolfgang Huemmer, Limburgerhof, and Dieter Littmann, Hessheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Mar. 17, 1989, Ser. No. 324,829

Claims priority, application Fed. Rep. of Germany, Mar. 17, 1988, 3808951

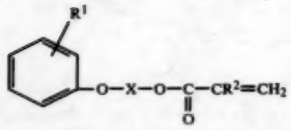
Int. Cl.[5] G03C *1/76*

U.S. Cl. 430—271 **8 Claims**

1. A photopolymerizable laminate suitable for producing flexible and resilient printing plates comprising a dimensionally stable base, a relief-forming photopolymerizable layer and at least one intermediate layer between the dimensionally stable base and the relief-forming photopolymerizable layer, the relief-forming photopolymerizable layer consisting essentially of a mixture of polymeric binder, at least one ethylenically unsaturated polymerizable compound, at least one photoinitiator and at least one thermal polymerization inhibitor, wherein

said polymeric binder is at least one water-soluble compound selected from the group consisting of graft polymers soluble or dispersible in aqueous solvents and prepared by polymerization of vinyl esters in the presence of polyalkylene oxides and a free-radical polymerization initiator, hydrolysed or partially hydrolysed graft polymers thereof, and graft polymers obtained by subsequent esterification or transesterification of vinyl alcohol units of such hydrolysed or partially hydrolysed graft polymer, polyvinyl alcohols which are partially esterified with acrylic or methacrylic acid and polyvinyl alcohols which are partially acetalated, and

said ethylenically unsaturated polymerizable compound is a compound of the formula (I)



(I)

wherein R^1 is hydrogen or alkyl of from 1 to 10 carbon atoms or aryl of from 6 to 10 carbon atoms, R^2 is hydrogen or methyl, X is

$$-(CH_2-CH_2-O)_n-C_2-H_4-,\ -C_2H_4-,$$

$$-(CHCH_3-CH_2-O)_n-CHCH_3-CH_2-,$$

$$-CH_2-\underset{\underset{OH}{|}}{CH}-CH_2- \text{ or } -CH_2-\underset{\underset{CH_2OH}{|}}{CH}-$$

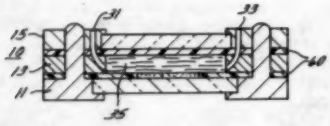
and n is from 0 to 8.

4,960,674

METHOD OF FABRICATING FLUIDIC PLATES AND DEVICES BY IRRADIATION OF PHOTOPOLYMERS

Efrem V. Fudim, Whitefish Bay, and Jeannine O. Colla, Mequon, both of Wis., assignors to Johnson Service Company, Milwaukee, Wis.

Filed Dec. 17, 1984, Ser. No. 682,090
Int. Cl.[5] G03C 1/725
U.S. Cl. 430—284 13 Claims



1. A method for forming a perimeter-supportable diaphragm plate having a movable diaphragm and useful as a component of a pneumatic control device, the method including the steps of:

providing a vessel containing a quantity of a light-transmittive first photopolymer compound for forming a diaphragm plate, said first compound including, as mixed constituents, a reactive oligomer resin, a reactive monomer diluent and a photoinitiator;

irradiating a first unmasked surface of said compound with ultraviolet light for solidifying said first surface to a depth equal to the desired thickness of a diaphragm, said ultraviolet light having a wavelength in the range of 300–400 nm;

irradiating a second surface of said compound with said ultraviolet light, said second surface being partially covered by an opaque mask defining the shape of said diaphragm, said irradiating of said second surface thereby forming said diaphragm plate by solidifying the unmasked quantity of said compound, and;

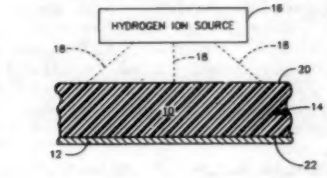
removing the unsolidified compound from the masked area of said plate.

4,960,675

HYDROGEN ION MICROLITHOGRAPHY

Y. Simon Tsuo, Lakewood, and Satyen K. Deb, Boulder, both of Colo., assignors to Midwest Research Institute, Kansas City, Mo.

Filed Aug. 8, 1988, Ser. No. 229,298
Int. Cl.[5] G03C 5/00
U.S. Cl. 430—311 24 Claims



PROVIDE SUBSTRATE
DEPOSIT SINGLE THIN-FILM a-Si OR a-Si:H
PREFERENTIAL EXPOSURE OF THIN-FILM BY LOW-ENERGY HYDROGEN ION SOURCE
DEVELOP THIN-FILM BY WET OR DRY DEVELOPER

1. An ion-beam lithography process useful in microelectronic fabrication and semiconductor device processing, said process comprises the steps of:

(a) providing a layer of either an amorphous silicon or hydrogenated amorphous silicon materials;

(b) recording a pattern in said layer by preferentially implanting hydrogen therein to permit said layer to serve as a resist suitable for subsequent development; and

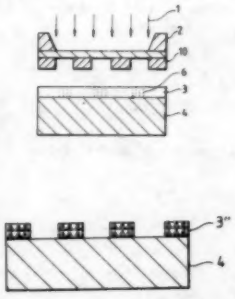
(c) developing said layer to provide a surface pattern therein for subsequent use in said microelectronic fabrication and said semiconductor device processing.

4,960,676

METHOD FOR FORMING PATTERN BY USING GRAFT COPOLYMERIZATION

Kozo Mochiji, Hachioji; Hiroaki Oizumi, Kokubunji; Yasunari Soda, Koganei, and Takeshi Kimura, Higashimurayama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed May 27, 1988, Ser. No. 199,712
Claims priority, application Japan, May 29, 1987, 62-131129; Jul. 10, 1987, 62-171145
Int. Cl.[5] G03C 5/16
U.S. Cl. 430—326 2 Claims



1. A method for forming a pattern which comprises a step of irradiating a resist layer which is capable of forming radicals

and peroxides upon being exposed to X-ray radiation and which is applied on a substrate to be worked, with X-ray radiation through a mask in an oxygen-containing atmosphere to expose said resist layer, a step of irradiating the whole surface of said resist layer with an ultraviolet ray radiation in an atmosphere free from oxygen, a step of introducing a monomer into said atmosphere free from oxygen to conduct graft copolymerization of said unexposed layer with said monomer, and a step of developing said resist layer to remove said resist layer at the portion remaining ungrafted.

4,960,677

DRY NONELECTROSCOPIC TONERS SURFACE COATED WITH ORGANOFUNCTIONAL SUBSTITUTED FLUOROCARBON COMPOUNDS

Josette C. Seibles, Piscataway, and Howard Matrick, Highlands, both of N.J., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Aug. 14, 1987, Ser. No. 86,018
Int. Cl.[5] G03C *5/04*
U.S. Cl. 430—331 **33 Claims**

1. A dry nonelectroscopic toner comprising pigmented organic resin particles having a size distribution within the range of 0.2 to 30 micrometers and not more than 50 percent of the particles being less than 1 micrometer particle size, the improvement wherein the pigmented particles are surface coated with 3 to 40% by weight of an organofunctional substituted fluorocarbon compound having a boiling point under normal atmospheric conditions greater than 300° F., and

(1) having a general formula R(f)QA wherein

R(f) is a perfluoroalkyl group,

$C_nF_{(2n+1)}$, where n is from 4 to 20;

Q is a divalent bridging group capable of connecting the R(f) group with the A group,

Q being an alkylene/oxy group, $(-CH_2-)_xO-$, or an alkylene group, $(-CH_2-)_x$, where x is from 2 to 6; a sulfonamido group, $-SO_2N(R_1)-$; or a sulfonamido/alkylene group, $-SO_2N(R_1)(CH_2)_x-$, where R_1 is C_1 to C_6 alkyl and x is from 2 to 6; and

A is the terminal group, A being H when Q is sulfonamido; $-(R_2O)_mR_3$ where R_2 is an alkylene group of 2 to 6 carbons or mixtures thereof, and

R_3 is H or C_1 to C_4 alkyl, and m is 1 to 22; or

A is an acrylate group, $-OOCC(R_4)=CH_2$, where R_4 is H, $-CH_3$, or $-C_2H_5$; or

(2) being a fluoroaliphatic polymeric ester.

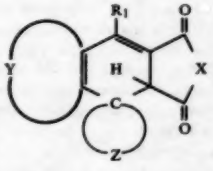
4,960,678

PHOTOCHROMIC COMPOUNDS

Takashi Tanaka, Shinnanyo; Satoshi Imura, Tokuyama, and Yasuji Kida, Kudamatsu, all of Japan, assignors to Tokuyama Soda Kabushiki Kaisha, Yamaguchi, Japan

Division of Ser. No. 268,497, Nov. 8, 1988, Pat. No. 4,882,438. This application Sep. 6, 1989, Ser. No. 403,487
Claims priority, application Japan, Nov. 10, 1987, 62-282131; Nov. 11, 1987, 62-283116; Apr. 2, 1988, 62-80250
Int. Cl.[5] G03C *1/733*
U.S. Cl. 430—332 **4 Claims**

1. A composition comprising a high-molecular-weight polymer and a compound represented by general formula (I)



[I]

wherein

represents a divalent aromatic hydrocarbon group or a divalent unsaturated heterocyclic group each of which may have a substituent,

R_1 represents a monovalent hydrocarbon group or a monovalent heterocyclic group each of which may have a substituent,

represents a norbornylidene group or an adamantylidene group each of which may have a substituent, and

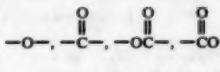
X represents an oxygen atom, the group $>N-R_2$, the group $>N-A_1-B_1-(A_2)_m(B_2)_nR_3$, the group $>N-A_3-A_4$, or the group $>N-A_3-R_4$, provided that when

is an adamantylidene group, X is selected from the above groups excepting the oxygen atom and the group $>N-R_2$, in which

R_2 represents a hydrogen atom, an alkyl group having 1 to 20 carbon atoms, or an aryl group having 6 to 10 carbon atoms,

A_1 and A_2 are identical or different and each represents an alkylene group having 1 to 10 carbon atoms, an alkylidene group having 2 to 10 carbon atoms, a cycloalkylene group having 3 to 10 carbon atoms or an alkylcycloalkanediyl group having 6 to 10 carbon atoms,

B_1 and B_2 are identical or different, and each represents



m and n, independently from each other, represent 0 or 1, provided that when m is 0, n is also 0,

R_3 represents an alkyl group having 1 to 10 carbon atoms, a naphthyl group or a naphthylalkyl group having 1 to 4 carbon atoms in the alkyl moiety, the alkyl group having 1 to 10 carbon atoms being optionally substituted by 1 to 3 atoms or groups selected from the class consisting of halogen atoms, cyano groups and nitro groups, and the naphthyl or naphthylalkyl group being optionally substituted by 1 to 3 atoms or groups selected from the class consisting of halogen atoms, cyano groups, nitro groups, alkylamino groups having 1 to 3 carbon atoms, alkyl groups having 1 to 3 carbon atoms and alkoxy groups having 1 to 3 carbon atoms,

A_3 represents an alkylene group having 1 to 10 carbon atoms, an alkylidene group having 2 to 10 carbon atoms, a cycloalkylene group having 3 to 10 carbon atoms, or an alkylcycloalkanediyl group having 6 to 10 carbon atoms,

A_4 represents a naphthyl group which may be substituted by 1 to 3 atoms or groups selected from the class consisting of halogen atoms, cyano groups, nitro groups, alkylamino groups having 1 to 3 carbon atoms, alkyl groups having 1

to 3 carbon atoms and alkoxy groups having 1 to 3 carbon atoms, and

R_4 represents a halogen atom, a cyano group or a nitro group.

4,960,679

IMAGE FORMING DEVICE

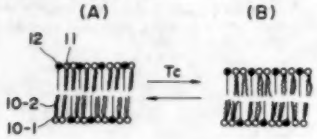
Takashi Nakagiri, Tokyo; Yukuo Nishimura, Sagamihara; Kunihiro Sakai, Tokyo; Yoshinori Tomida; Ken Eguchi, both of Yokohama, and Kenji Saito, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 823,287, Jan. 28, 1986, abandoned. This application Jan. 11, 1990, Ser. No. 462,912

Claims priority, application Japan, Jan. 31, 1985, 60-17029; Jan. 31, 1985, 60-17030; Jan. 31, 1985, 60-17031; Jan. 31, 1985, 60-17032; Jan. 31, 1985, 60-17033; Jan. 31, 1985, 60-17034; Jan. 31, 1985, 60-17035; Jan. 31, 1985, 60-17037; Jan. 31, 1985, 60-17038; Jan. 31, 1985, 60-17039; Jan. 31, 1985, 60-17040; Jan. 31, 1985, 60-17041

Int. Cl.[5] **G03C** *1/73*

U.S. Cl. 430—335 **7 Claims**



1. An image-forming device comprising: an image-forming layer formed by the Langmuir-Blodgett process containing a solid organic compound which changes from a solid state to a fluid soft state when heated and a photochromic compound capable of effecting image-formation or information-conversion by undergoing color change when said organic compound is in a fluid or soft state.

4,960,680

RECORDING ELEMENTS COMPRISING WRITE-ONCE THIN FILM ALLOY LAYERS

Kee-Chuan Pan; Yuan-Sheng Tyan, both of Webster, and Donald R. Preuss, Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 194,605, May 16, 1988, which is a continuation-in-part of Ser. No. 14,336, Feb. 13, 1987, abandoned. This application Sep. 25, 1989, Ser. No. 412,041

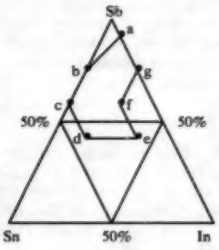
Int. Cl.[5] **G03C** *1/72;* **G11B** *7/24*

U.S. Cl. 430—346 **11 Claims**

1. A method of recording information, comprising the steps of:

(a) providing a recording element comprising a write-once amorphous thin-film optical recording layer of an alloy having a composition within a polygon in a ternary composition diagram of antimony, indium, and tin; wherein

(i) the composition diagram is



; and

(ii) the polygon has the following vertices and corresponding coordinates in atom percent:

Vertices	Coordinates		
	Sb	Sn	In
a	97	0	3
b	85	15	0
c	60	40	0
d	48	42	10
e	44	10	46
f	64	5	31
g	70	0	30

; and

(b) focusing an information modulated laser beam on the recording layer to form a pattern of crystalline and amorphous areas in the layer; wherein all the crystalline areas are in the same state with a higher reflectivity than the amorphous areas.

4,960,681

PROCESS FOR FORMING AN IMAGE

Yasuo Aotsuka, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 919,115, Feb. 15, 1986, abandoned. This application Mar. 9, 1990, Ser. No. 492,374

Claims priority, application Japan, Oct. 18, 1985, 60-232965; Apr. 18, 1986, 61-89513

Int. Cl.[5] **G03C** *8/32, 1/494*

U.S. Cl. 430—351 **16 Claims**

1. A process for forming an image comprising heating a heat-developable light-sensitive material comprising a support having thereon at least a light-sensitive silver halide and a high molecular weight compound having an average molecular weight of from 1×10^4 to 2×10^6 containing a repeating unit derived from a vinyl monomer having at least one of a group —COOM and a group $-SO_3M$ wherein M represents a hydrogen atom or an alkali metal atom, simultaneously with or after imagewise thereof, in the presence of water externally supplied in an amount between 0.1 times the weight of the entire coated layer and the weight of water corresponding to the maximum swelling volume of the entire coating layer, and at least one of a base and a base precursor.

4,960,682

BLEACHING COMPOSITIONS CONTAINING A DYE-STABILIZING AGENT AND USE THEREOF IN PHOTOGRAPHIC COLOR PROCESSING

Ann M. Cullinan, Henrietta, and Paul A. Schwartz, Webster, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 19, 1988, Ser. No. 286,111

Int. Cl.[5] G03C *5/58, 5/44*

U.S. Cl. 430—393 **4 Claims**

1. A method for processing a silver halide color photographic element including the steps of treating said element with a color developing bath and with a bleaching/dye-stabilizing bath, wherein said bleaching/dye-stabilizing bath contains a dye-stabilizing amount of a formaldehyde precursor.

4,960,683

METHOD FOR PROCESSING A BLACK-AND-WHITE PHOTOSENSITIVE MATERIAL

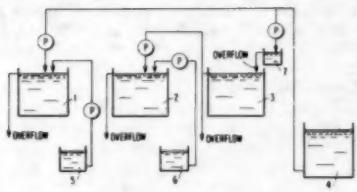
Masaki Okazaki; Akihiko Ikegawa; Minoeu Yamada, and Kunio Steo, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jun. 29, 1988, Ser. No. 212,995

Claims priority, application Japan, Jun. 29, 1987, 62-161478; Jul. 9, 1987, 62-171795; Jul. 17, 1987, 62-178701; Jul. 30, 1987, 62-191312

Int. Cl.[5] G03C *5/38*

U.S. Cl. 430—428 **24 Claims**



1. A method for processing a black-and-white photosensitive material comprising the steps of:

(a) exposing a silver halide photosensitive material having been spectrally sensitized with a sensitizing dye;

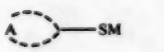
(b) developing said exposed material;

(c) fixing said developed material; and

(d) thereafter at least one step selected from the group consisting of washing said material and stabilizing said material;

said fixing step being performed in the presence of at least one compound represented by formula (I) or (II) or a salt thereof:

(I)



wherein A represents an atomic group necessary for forming a saturated or unsaturated 3-membered to 8-membered ring comprising at least one hetero atom selected from the group consisting of an oxygen atom, a nitrogen atom, a sulfur atom and a selenium atom; and M represents a hydrogen atom or a counter cation; and

$$X-(R_1-S)_n-R_2-S-R_3-Y \qquad (II)$$

wherein R_1, R_2 and R_3, which may be the same or different, each represents an alkylene group; R_1 and R_3 may be linked to form a ring, R_2 and R_3 may be linked to form a ring; X and Y, which may be the same or different, each represents a hydrogen atom, an alkyl group, an amino group, an ammonio group, a hydroxyl group, a carboxyl group, a sulfo group, an aminocarbonyl group or an aminosulfonyl group, and X and Y may be linked to form a ring; and n is an integer of from 0 to 10.

4,960,684

METHOD FOR PROCESSING SILVER HALIDE COLOR PHOTOGRAPHIC MATERIALS

Takatoshi Ishikawa; Hiroshi Fujimoto; Morio Yagihara, and Kazuto Andoh, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

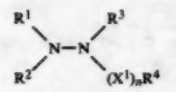
Filed Jan. 23, 1989, Ser. No. 299,592

Claims priority, application Japan, Jan. 21, 1988, 63-11287; Jan. 21, 1988, 63-11297

Int. Cl.[5] G03C *7/00, 7/30*

U.S. Cl. 430—467 **16 Claims**

1. A method for processing a silver halide color photographic material which has been imagewise exposed, comprising processing the exposed photographic material with a color developer which contains an aromatic primary amine developing agent, at least one compound of the following formula (I) and at least one compound of the following formula (II) and which has an opening ratio of 0.20 cm^{-1} or less:



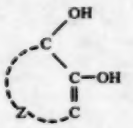
(I)

wherein R^1, R^2 and R^3 independently represent a hydrogen atom, an alkyl group, an aryl group or a heterocyclic group;

R^4 represents a hydrogen atom, a hydroxyl group, a hydrazino group, an alkyl group, an aryl group, a heterocyclic group, an alkoxy group, an aryloxy group, a carbamoyl group or an amino group;

X^1 represents a divalent group;

n represents 0 or 1; and when n is O, R^4 represents an alkyl group, an aryl group or a heterocyclic group; and R^3 and R^4 may together form a heterocyclic group



(II)

where Z represents an atomic group which completes and forms an aromatic nucleus.

4,960,685

COLOR PHOTOGRAPHIC ELEMENT AND PROCESS

Arlyce T. Bowne, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

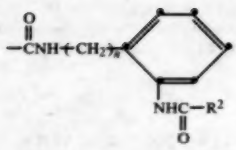
Filed Dec. 20, 1989, Ser. No. 453,523

Int. Cl.[5] G03C *1/46*

U.S. Cl. 430—505 **6 Claims**

1. A color photographic silver halide element comprising a support bearing at least one red-sensitive silver halide emulsion layer comprising at least one cyan dye-forming coupler, at least one green-sensitive silver halide emulsion layer comprising at least one magenta dye-forming coupler and at least one blue-sensitive silver halide emulsion layer containing at least one yellow dye-forming coupler wherein

(A) the cyan dye-forming coupler is a naphtholic coupler comprising in the 2- position an amide group represented by the formula:



wherein n is 1 to 4 and R^2 is alkyl or aryl; and comprising in the 4- position a substituted phenoxy ballast group;

(B) the magenta dye-forming coupler is a pyrazolo[3,2-c]-s-triazole comprising a substituted or unsubstituted phenyl group in the 3-position or 6-position; and,

(C) the yellow dye-forming coupler is a 2-equivalent pivaloylacetanilide coupler comprising a substituted hydantoin or phenoxy coupling-off group; when the coupling-off group is phenoxy, the anilide moiety contains ortho-alkoxy or ortho-aryloxy.

4,960,686

SILVER HALIDE PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL CONTAINING OXONOL DYE

Yasuhiko Kawashima; Shinri Tanaka, both of Hino; Tamotsu Kojima, Kokubunji, and Nobuaki Kagawa, Hachioji, all of Japan, assignors to Konica Corporation, Tokyo, Japan

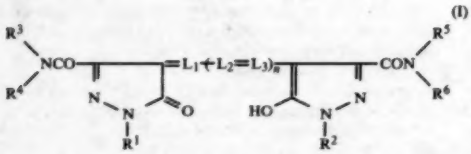
Filed Sep. 27, 1989, Ser. No. 413,305

Claims priority, application Japan, Sep. 30, 1988, 63-244254

Int. Cl.[5] G03C *1/825*

U.S. Cl. 430—522 **6 Claims**

1. A silver halide photographic light-sensitive material containing a water-soluble oxonol dye represented by the following Formula I:



(I)

wherein R^1 and R^2 are each a hydrogen atom, an alkyl group, an aryl group or a alkenyl group; R^3, R^4, R^5 and R^6 are each a hydrogen atom, an alkyl group, an aryl group, an alkenyl group or a heterocyclic group provided that at least one of said R^3, R^4, R^5 and R^6 is a heterocyclic group and R^3 and R^4, and R^5 and R^6 are respectively allowed to bond to form a heterocyclic ring; and the groups represented by said R^1 through R^6 are allowed to be substituted or unsubstituted provided that at least one of said groups is a water-solubilizing group or a group having a water-solubilizing group; L_1, L_2 and L_3 are each a substituted or unsubstituted methine group; and n is an integer of zero, 1 or 2.

4,960,687

PROCESS OF MAKING PHOTOGRAPHIC SILVER HALIDE ELEMENT WITH BACKING LAYERS WITH IMPROVED COATING PROPERTIES

Thomas B. Cho, East Brunswick, N.J., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Sep. 29, 1989, Ser. No. 414,420

Int. Cl.[5] G03C *1/82*

U.S. Cl. 430—527 **7 Claims**

1. A process for preparing a photographic film comprising (a) coating on a support at least one silver halide emulsion layer, and (b) coating on the opposite side of said support, in order, (1) a layer containing an antistatic agent and (2) an auxiliary layer consisting essentially of at least one crosslinkable, conductive polymer having functionally attached carboxylic acid groups selected from the group consisting of poly(-sodium styrene sulfonate-maleic anhydride), hexadecyl betaine, alkyldimethyl betaines, carboxylated imidazolines, coco amido betaines, and mixtures thereof, and a polyfunctional aziridine crosslinking agent therefor, dispersed in gelatin, with the proviso that until just prior to coating auxiliary layer (2) on the antistatic layer (1), whereby a smooth, defect-free coating is obtained, the polyfunctional aziridine crosslinking agent is maintained separate from said at least one crosslinkable conductive polymer and said gelatin and is stabilized at a pH of 9.0 to 11.5, and the stabilized aziridine crosslinking agent is combined with said at least one crosslinkable, conductive polymer and said gelatin.

4,960,688

SILVER HALIDE COLOR PHOTOGRAPHIC MATERIAL

Kei Sakanoue; Yoshio Ishii, and Tsumoru Hirano, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Feb. 29, 1988, Ser. No. 161,865

Claims priority, application Japan, Feb. 27, 1987, 62-44790; Feb. 27, 1987, 62-44791; Feb. 27, 1987, 62-44792; Dec. 14, 1987, 62-315766

Int. Cl.[5] G03C *1/30, 7/327*

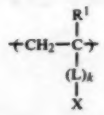
U.S. Cl. 430—548 **21 Claims**

1. A silver halide color photographic material comprising a support having thereon at least one silver halide emulsion layer, wherein the silver halide color photographic material contains a water-soluble polymer comprising at least one repeating unit represented by formula (I):

(I)

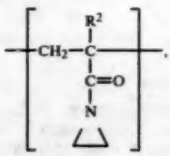
wherein A represents a vinyl monomer repeating unit having a color coupler moiety which is capable of forming a dye upon coupling with an oxidation product of an aromatic primary amine developing agent;

and at least one repeating unit selected from the group consisting of units represented by following formulae (II-A), (II-B), (II-C), (II-D), (II-E), and (II-F);



(II-A)

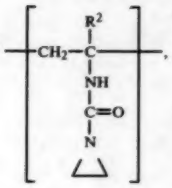
wherein R^1 represents a hydrogen atom, a lower alkyl group having from 1 to 6 carbon atoms or a chlorine atom; L represents a divalent group having from 1 to 20 carbon atoms, K represents 0 or 1; and X represents an active ester group;



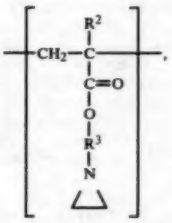
(II-B)

-continued

(II-C)

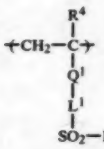


(II-D)

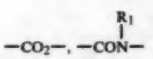


wherein R^2 represents a hydrogen atom, a chlorine atom or a lower alkyl group having from 1 to 6 carbon atoms, and R^3 represents an alkylene group;

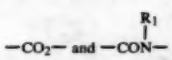
(II-E)



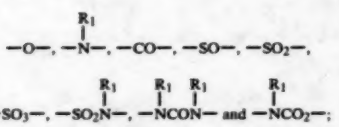
wherein R^4 represents a hydrogen atoms or a lower alkyl group having from 1 to 6 carbon atoms; Q^1 represents



or an arylene group having from 6 to 10 carbon atoms; L^1 represents a divalent group having from 3 to 15 carbon atoms and containing at least one bond selected from

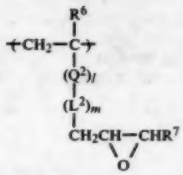


or a divalent group having from 1 to 12 carbon atoms and containing at least one bond selected from

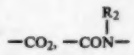


R_1 represents a hydrogen atom or a lower alkyl group having from 1 to 6 carbon atoms; R^5 represents $-CH=CH_2$ or $-CH_2CH_2X_1$; and X_1 represents a group capable of being substituted with a nucleophilic group or of being released by a base in the form of HX_1;

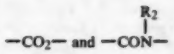
(II-F)



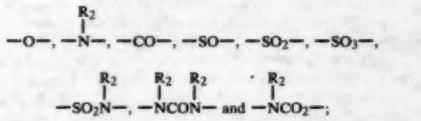
wherein R^6 represents a hydrogen atom, a chlorine atom or an alkyl group; Q^2 represents



or an arylene group having from 6 to 10 carbon atoms; L^2 represents a divalent group having from 3 to 15 carbon atoms and containing at least one bond selected from



or a divalent group having from 1 to 12 carbon atoms and containing at least one bond selected from



R_1 represents a hydrogen atom or a lower alkyl group having from 1 to 6 carbon atoms; R^7 represents a hydrogen atom or an alkyl group; l and m each represents 0 or 1, and l and m are not 0 at the same time.

4,960,689

COLOR PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL AND METHOD OF DEVELOPING THE SAME

Toshihiro Nishikawa; Shunji Takada, and Kazunori Hasebe, all of Ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Ashigara, Japan

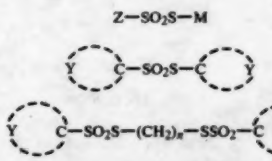
Filed Jun. 2, 1988, Ser. No. 201,406

Claims priority, application Japan, Jun. 5, 1987, 62-139983

Int. Cl.[5] G03C *1/035, 1/09, 1/34*

U.S. Cl. 430—603 **5 Claims**

1. A silver halide color photographic light-sensitive material comprising a support having thereon at least one silver halide emulsion layer, wherein said emulsion layer contains a silver halide emulsion which comprises silver halide grains consisting of at least 95 mol % of silver chloride and which is chemically sensitized in the presence of at least one of the compounds represented by formulas (I) to (III):



Formula [I]

Formula [II]

Formula [III]

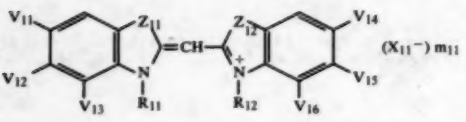
wherein z represents alkyl having 1 to 18 carbon atoms, aryl having 6 to 18 carbon atoms, or heterocyclic,

Y represents an atom group required for forming heterocyclic or aryl having 6 to 18 carbon atoms,

M represents a metal cation, an organic cation, or a hydrogen atom, and n represents an integer from 2 to 10;

said silver halide grains are spectrally sensitized by at least one of the sensitizing dyes represented by formulas (XXa), (XXb), and (XXc), where

Formula (XXa)



wherein Z_{11} represents oxygen, sulfur, or selenium, Z_{12} represents sulfur or selenium;

R_{11} and R_{12} each represent alkyl or alkenyl which is either substituted or unsubstituted and has six carbon atoms or less; with the provisos that at least one of R_{11} or R_{12} represents sulfo-substituted alkyl; and

when Z_{11} represents oxygen, V_{11} and V_{13} represent hydrogen, and V_{12} represents phenyl, alkyl having 3 carbon atoms or less or alkoxy having 3 carbon atoms or less or phenyl substituted with chlorine, or that V_{11} and V_{12}, or V_{12} and V_{13} can be coupled to form a condensed benzene ring; and

when Z_{11} represents sulfur or selenium, V_{11} represents alkyl or alkoxy each having four carbon atoms or less, or hydrogen, V_{12} represents alkyl having five carbon atoms or less, alkoxy having four carbon atoms or less, chlorine, hydrogen, substituted or unsubstituted phenyl or hydroxyl, and V_{13} represents hydrogen, or that V_{11} and V_{12}, or V_{12} and V_{13} can be coupled to form a condensed benzene ring; and

when Z_{12} represents selenium, V_{14}, V_{15}, and V_{16} represent the same meanings as those represented by V_{11}, V_{12}, V_{13} when Z_{11} represents selenium, respectively; and

when Z_{12} represents sulfur and Z_{11} represents selenium, V_{14} represents hydrogen, alkoxy having four carbon atoms or less, or alkyl having five carbon atoms or less, V_{15} represents alkoxy having four carbon atoms or less, substituted or unsubstituted phenyl, alkyl having four carbon atoms or less, chlorine, or hydroxyl, and V_{16} represents hydrogen, or that V_{14} and V_{15}, or V_{15} and V_{16} can be coupled to form a condensed benzene ring; and

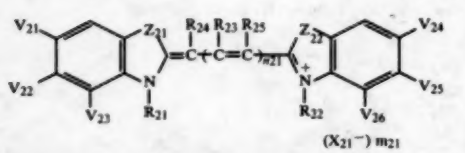
when both Z_{11} and Z_{12} represent sulfur, V_{14} and V_{16} represent hydrogen, and V_{15} represents substituted or unsubstituted phenyl, or that V_{14} represents hydrogen and V_{15} and V_{16} can be coupled to form a condensed benzene ring; and

when Z_{11} represents oxygen and Z_{12} represents sulfur, V_{14} and V_{16} represent hydrogen, and V_{15} represents chlorine, substituted or unsubstituted phenyl or alkoxy having four carbon atoms or less, or that V_{15} and V_{16} can be coupled to form a condensed benzene ring;

X^-_{11} represents an anion residue of an acid; and

m_{11} represents 0 or 1;

Formula (XXb)



wherein Z_{21} and Z_{22} can be the same or different and represent oxygen, sulfur, selenium or N-R_{26};

R_{21} and R_{22} represent the same meanings as those represented by R_{11} and R_{12} of formula (XXa), and also represent that R_{21} and R_{24} or R_{22} and R_{25} can be coupled to form a 5- or 6-membered carbon ring; with the provisos that

when n_{21} represents 2 or 3, R_{21} and R_{22} do not represent a substituting group having sulfo at the same time;

when at least one of Z_{21} and Z_{22} represents N-R_{26}, R_{23} represents hydrogen, and otherwise, represents lower alkyl or phenethyl;

when n_{21} represents 2 or 3, R_{23} represents lower alkyl on phenethyl and R_{23} can be coupled to form a 5- or 6-membered ring;

R_{24} and R_{25} represent hydrogen;

R_{26} and R_{27} represent the same meanings as that represented by R_{21} or R_{22}, with the provisos that R_{21} and R_{26} do not represent a substituting group having sulfo at the same time and that R_{22} and R_{26} represent a substituting group having sulfo at the same time;

when Z_{21} represents oxygen, V_{21} represents hydrogen;

when Z_{21} represents sulfur or selenium, V_{21} represents hydrogen, or an alkyl or alkoxy, each having five carbon atoms or less;

when Z_{21} represents N-R_{26}, V_{21} represents hydrogen or chlorine;

when Z_{21} represents oxygen and Z_{22} represents N-R_{27}, V_{22} represents hydrogen, alkyl or alkoxy, each having five carbon atoms or less, chlorine, or substituted or unsubstituted phenyl, that V_{22} can be coupled to V_{21} or V_{23} to form a condensed benzene ring;

when Z_{21} and Z_{22} both represent oxygen, V_{22} represents substituted or unsubstituted phenyl or represents that V_{22} can be coupled to V_{21} or V_{23} to form a condensed benzene ring;

when Z_{21} represents sulfur or selenium, V_{22} represents hydrogen, alkyl or alkoxycarbonyl, each having five carbon atoms or less, alkoxy or acylamino, each having four carbon atoms or less, chlorine, or substituted or unsubstituted phenyl or that V_{22} can be coupled to V_{23} to form a condensed benzene ring;

when Z_{21} represents N-R_{26}, V_{22} represents chlorine, trifluoromethyl, cyano, alkylsulfonyl having four carbon atoms or less, or alkoxycarbonyl having five carbon atoms or less;

V_{23} represents hydrogen;

V_{24} represents the same meaning as that represented by V_{21} when Z_{22} represents an atom type corresponding to that represented by Z_{21};

when Z_{22} represents oxygen, V_{25} represents alkoxy having four carbon atoms or less, chlorine, or substituted or unsubstituted phenyl, or represents that V_{25} can be coupled to V_{24} or V_{26} to form a condensed benzene ring;

when Z_{22} represents N-R_{26}, V_{25} represents the same meaning as that represented by V_{22} when Z_{21} represents N-R_{26};

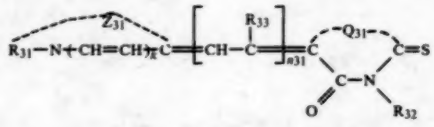
when Z_{22} represents sulfur or selenium, V_{25} represents the same meaning as that represented by V_{22} when Z_{21} represents sulfur or sulfur or selenium;

V_{26} represents hydrogen;

X^-_{21} represents an anion residue of an acid;

m_{21} represents 0 or 1; and

n_{21} represents 1, 2, or 3;



wherein Z_{31} *represents an atom group required for forming substituted or unsubstituted nuclei of thiazoline, thiazole, benzothiazole, naphthothiazole, selenazoline, selenazole, benzoselenazole, naphthoselenzaole, benzimdazole, naphthoimidazole, oxazole, benzolazole, naphthooxazole, or pyridine;*

R_{31} represents the same meaning as that represented by R_{11}

or R_{12} of formula (XXa), R_{32} represents the same meaning as that represented by R_{11} or R_{12} of formula (XXa), and also represents hydrogen, furfuryl, or moncyclic aryl, and also represents that at least one of R_{31} and R_{32} is a substituting group having sulfo or carboxyl and the other is a group not containing sulfo; R_{33} represents hydrogen, alkyl having five carbon atoms or less, phenethyl, phenyl, 2-carboxyphenyl, and when n represents 2 or 3, also represents that different R_{33} and R_{33} can be coupled to form a 5- or 6-membered ring;

Q_{31} represents oxygen, sulfur, selenium, or N-R_{34}, R_{34} represents hydrogen, pyridil, phenyl, substituted phenyl or an aliphatic hydrocarbon group having eight carbon atoms or less which may contain oxygen, sulfur, or nitrogen in a carbon chain; or can contain a substituting group;

k represents 0 or 1; and

n_{31} represents 0, 1, 2, or 3.

4,960,690

NUCLEIC ACID PROBES FOR PRENATAL SEXING

Steven B. Ellis, La Jolla, and Michael M. Harpold, San Diego, both of Calif., assignors to The Salk Institute Biotechnology Industrial Associates, Inc., San Diego, Calif.

Continuation-in-part of Ser. No. 739,817, May 31, 1985, Pat. No. 4,769,319. This application Jun. 5, 1986, Ser. No. 871,111

Int. Cl.[5] C12Q *1/68*; C07H *15/12*

U.S. Cl. 435—6 **33 Claims**

27. A method of sexing an embryo or fetus of a species of a genus Bos which comprises:

(i) contacting the DNA of cells of said embryo or fetus under hybridization conditions with one or more hybridization probes, each of which is a detectably labeled, single-stranded nucleic acid which comprises:

(a) a segment which has substantially the same sequence as that of either strand of a fragment selected from the group consisting of:

(1) the smaller PstI fragment of plasmid pES5(2),

(2) the smaller PstI fragment of plasmid pES8, and

(3) the 6.2 kbp EcoRI fragment of the genome of lambda-ES6.0; or

(b) any segment, more than 20 bp in length, of the segment of subparagraph (i)(a) of this claim;

provided that at least one of said single-stranded nucleic acids, under the hybridization conditions, hybridizes to a significantly greater extent with total DNA of males of a breed of a species of the genus Bos than with total DNA of females of the breed; and

(ii) ascertaining whether significant hybridization occurs between the DNA of the cells of the embryo or fetus and the hybridization probe or probes, wherein significantly greater hybridization is an indication of the presence of a male embryo or fetus.

4,960,691

CHROMATOGRAPHIC TEST STRIP FOR DETERMINING LIGANDS OR RECEPTORS

Julian Gordon, Lake Bluff; Michael E. McMahon, Libertyville, and Shanfun Ching, Vernon Hills, all of Ill., assignors to Abbott Laboratories, Abbott Park, Ill.

Filed Sep. 29, 1986, Ser. No. 912,878

Int. Cl.[5] C12Q *1/68*; G01N *33/543, 33/548, 33/558*

U.S. Cl. 435—6 **33 Claims**

1. A test strip for analysis of an analyte in a sample by means of a sequential series of reactions, said strip comprising:

a length of chromatographic material having capillarity and the capacity for chromatographic solvent transport of non-immobilized reagents and reactive sample components by means of a selected chromatographic solvent, said strip including,

a first end at which chromatographic solvent transport begins;

a second end, at which chromatographic solvent transport ends;

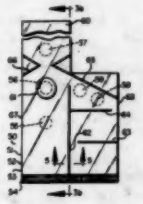
a plurality of chromatographic solvent transport pathways;

a plurality of zones positioned between said first and second ends, said zones including,

a first zone impregnated with a first reagent which is mobile in said solvent and capable of a specific binding reaction with said analyte,

a second zone for receiving said sample, and

a third zone, downstream of said second zone, impregnated with a second reagent which is immobilized against solvent transport and is capable of a specific binding reaction with the analyte so as to immobilize the analyte in said third zone, said first and second zones being spaced sufficiently from said first end to permit contact of said first



end but not said first and second zones with said chromatographic solvent, and

means for detecting said first reagent at said third zone as a measure of the analyte,

whereby, after said first end is dipped into said chromatographic solvent, the relative mobility of said sample components and said first reagent is controlled by said plurality of chromatographic solvent transport pathways such that the analyte is transported to and immobilized against solvent transport at the third zone prior to the first reagent reaching the third zone, and whereby interfering sample components and non-analyte components of the sample which are reactive with said first reagent are cleared from said third zone by chromatographic solvent transport prior to the first reagent reaching said third zone.

4,960,692

ASSAY EMPLOYING BINDING PAIR MEMBERS ON PARTICLES AND ON A FILTER OR MEMBRANE

Brian B. Lentrichia, Mahwah, N.J., and Michael F. Turanchik, Stoney Point, N.Y., assignors to Fisher Scientific Company, Pittsburgh, Pa.

Filed Mar. 18, 1986, Ser. No. 840,791

Int. Cl.[5] G01N *33/53, 33/535, 33/543, 33/544*

U.S. Cl. 435—7 **16 Claims**

1. A method of determining an analyte binding pair member in a biological sample which comprises the steps:

(a) contacting suspended particles bearing first reagent binding pair members complementary to analyte binding pair members with the biological sample under conditions under which the analyte binding pair members, if present, will bind to the first reagent binding pair members, and

(b) passing the reaction mixture of the contacting step (a) through a filter having pore size sufficiently large for the particles to pass through the filter if not bound to the filter; the filter bearing second reagent binding pair members complementary either to the analyte binding pair members or to the first reagent binding pair members; and

(c) detecting the particles passing through the filter as an indication of the presence and amount of analyte binding pair members in the biological sample.

4,960,693

SYSTEM OF REACTANTS INVOLVING AN APO-ENZYME USEFUL IN IMMUNOLOGICAL ANALYSIS AND A METHOD FOR CARRYING OUT IMMUOASSAYS WITH THIS SYSTEM

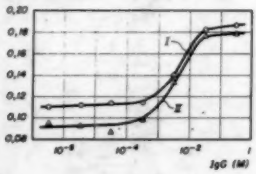
Iqbal Siddiqi, Geneva, and Claron Mangan, Onex, both of Switzerland, assignors to Intracel Corporation, Bridgetown, Barbados

Filed Jan. 6, 1988, Ser. No. 151,279

Claims priority, application European Pat. Off., Jan. 6, 1987, 87810005.6

Int. Cl.[5] G01N *33/535, 33/542*

U.S. Cl. 435—7 14 Claims



1. An assay for a bioreactive ligand species, comprising:

providing a labelled ligand species, wherein said labelled ligand species is a conjugate of said bioreactive species and an apoenzyme;

contacting a sample possibly containing said bioreactive ligand species with a known amount of a receptor which is specific for said bioreactive ligand species to produce a ligand-receptor species;

contacting said ligand-receptor species with a solution of said labelled ligand species to produce a mixture comprising a labelled ligand-receptor species and said ligand-receptor species;

contacting said mixture with an excess of a metal ion cofactor capable of converting said apoenzyme to the corresponding holoenzyme; and

determining the conversion of said apoenzyme to said holoenzyme as a measure of said bioreactive species.

4,960,694

TEST COMBINATION AND METHOD OF DETECTING FIBRIN MONOMERS IN BLOOD

Klaus Eckardt, Erfurter Strasse 58, 6900 Jena; Gottfried Toepfer, Am Feierabendheim 26, 8909 Goerlitz; Andreas Seifert, Theodor-Koerner-Strasse 5, 8900 Goerlitz; Manfred Schulze, Ludwigstrasse 2; Udo Funke, Rietschelstrasse 20, both of 8800 Zittau; Marlena Stepanauskas, deceased, late of Berlin; by Leonas-Vitas Stepanauskas, and Daina Stepanauskas, legal representative, both of Rudolf-Reusch-Strs. 43, 1156 Berlin; Heinz Thrum, deceased, late of Jena; by Margot Thrum, legal representative, Hermann-Löns-Str. 62, 6900 Jena; by Matthias Thrum, legal representative, Thomas-Mann-Str. 3, Schleiz, and by Michael Thrum, legal representative, Hermann-Löns-Str. 62, Jena, all of German Democratic Rep.

Filed Jul. 9, 1987, Ser. No. 71,799

Claims priority, application German Democratic Rep., Jul. 9, 1986, 2922981

Int. Cl.[5] G01N *33/68, 33/86*

U.S. Cl. 435—13 4 Claims

1. A method of detecting the presence of fibrin monomer in blood comprising the steps of:

a. mixing venous blood with an anticoagulant to form a mixture,

b. centrifuging said mixture,

c. removing plasma from said mixture,

d. mixing said plasma with a test reagent comprising an antibiotic of the pyrrole-amidine series dissolved in a buffer solution to form a reaction mixture, and

e. evaluating said reaction mixture for the presence of a precipitate indicative of the presence of said fibrin monomer in said blood.

4,960,695

FERMENTATION PROCESS TO PRODUCE 2-KETO-L-GLUONIC ACID

Tatsuo Hoshino, Kamakura; Setsuko Nomura, Fujisawa, and Teruhide Sugisawa, Yokohama, all of Japan, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Sep. 26, 1989, Ser. No. 412,758

Claims priority, application European Pat. Off., Sep. 30, 1988, 88116156

Int. Cl.[5] C12P *7/60, 39/00;* C12R *1/645, 1/01*

U.S. Cl. 435—42 30 Claims

1. A process for producing 2-keto-L-gluconic acid comprising fermentatively converting in a nutrient medium, L-sorbose to 2-keto-L-gluconic acid by the action of fermentation system containing:

a. a biologically homogeneous culture of a microorganism having the identifying characteristics of strain DSM No. 4025, and having substantially no ability to produce 2-keto-L-gluconic acid from L-sorbose; and

b. a yeast or a component obtained from said yeast having the growth promoting activity of the yeast from which said component is obtained.

4,960,696

PROCESS FOR PRODUCING PHYSIOLOLGICALLY ACTIVE SUBSTANCE BY MULTIENZYME PROCESS

Kazutomo Imahori, No. 2-25-23, Kakinokisaka, Meguro-ku, Tokyo; Hitoshi Kondo, Kyoto; Hiroshi Nakajima, Kyoto, and Tatsuo Iwasaki, Kyoto, all of Japan, assignors to Kazutomo Imahori, Tokyo; Rikagaku Kenkyusho, Saitama and Unitika Ltd., Hyogo, all of, Japan

Division of Ser. No. 461,308, Jan. 26, 1983, Pat. No. 4,882,276.

This application Jun. 6, 1988, Ser. No. 202,606

Int. Cl.[5] C12P *21/00, 39/00*

U.S. Cl. 435—42 10 Claims

1. A process for producing a physiologically active substance by a multienzyme process which comprises

(a) a process for converting AMP into ATP comprising the steps of:

providing separately or together a first enzyme and a second enzyme into a reactor, the first enzyme being capable of converting AMP into ADP and having been produced from microorganisms having an optimum growth temperature of 50° C. to 85° C., and the second enzyme being capable of converting ADP to ATP and having been produced from microorganisms having an optimum growth temperature of 50° C. to 85° C.;

adding AMP into the reactor to form ATP;

removing ATP from the reactor in an amount such that the reaction will continue to proceed to completion in the conversion of AMP into ATP, and

mixing ATP as a phosphoric acid donor with AMP and adding the resulting mixture to the reactor,

wherein the reaction is carried out at a temperature which retains desired activity;

wherein the mixing of AMP with ATP is carried out by controlling the concentration of ATP so as to satisfy the following formula (a):

$$0.15 \times \frac{5 + r^2}{r^2} \times AMP \geq ATP \geq 0.04 \times \frac{5 + r^2}{r^2} \times AMP \quad (a)$$

wherein AMP represents the concentration of AMP (mM), ATP represents the concentration of ATP (mM), and r represents a ratio of immobilized enzyme activity of the enzyme which converts ADP into ATP to immobilized enzyme activity of the enzyme which converts AMP into ADP, which is a positive integer of 1 or more; and

(b) synthesizing a physiologically active substance with the resulting ATP, converting the AMP resulting from the reaction in the step (b) into ATP by the reaction in the step (a), and repeatedly utilizing the converted ATP for synthesis of the physiologically active substance in the step (b).

4,960,697

RECOVERY OF POLYSACCHARIDES BY EMPLOYING A DIVALENT CATION WITH A WATER MISCIBLE ORGANIC SOLVENT

Sajit S. Johal, Sagamore Hills, and Howard S. Cash, Cleveland Heights, both of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Filed Jan. 6, 1989, Ser. No. 294,153

Int. Cl.[5] C12R *1/645;* C12P *19/04*

U.S. Cl. 435—101 **10 Claims**

1. A process for the recovery of nonionicglucan which is produced from filamentous fungi selected from the group consisting of the genera *Sclerotium, Sclerotinia, Corticum, Helotium, Stromatina,* Schizophyllum, and Calviceps which are cultured in culture medium, extracellular glucan is excreted into the culture medium by the fungi comprising (1) adding a divalent cation wherein the divalent cation is in the range from about 0.1% to about 20% of the volume of the solution and is a divalent cation salt of a divalent metal of calcium zinc, magnesium, manganese, iron, copper, colbalt, nickel and combinations thereof, to a solution containing solubilized nonionic glucan and (2) then adding a water miscible organic solvent wherein the water miscible organic solvent is added to the solution in the concentration range of about 10% to about 70% and selected from the group consisting of isopropyl alcohol, acetone, ethanol, methanol, iso-proponal, n-proponal, n-butanol, ether, acetonitrile and combinations thereof resulting in the precipitation of the glucan from solution.

4,960,698

PROCESS FOR PRODUCING L-654,040, ANTIBACTERIAL AGENT

Sara A. Currie, Roselle; Thomas W. Miller, Cartoret; Eugene L. Dulaney, Summit; James P. Springer, Mountainside; Mary E. Valiant, Plainfield, all of N.J.; Sagrario M. del Val, Madrid, Spain, and Sheldon B. Zimmerman, Springfield, N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 164,707, Mar. 7, 1988, abandoned. This application May 9, 1989, Ser. No. 349,279

Int. Cl.[5] C12P *17/16, 17/14, 1/06;* C12N *1/00*

U.S. Cl. 435—119 **1 Claim**

1. A method of preparing a compound of Formula I which comprises aerobically cultivating *Streptoverticillium synroense* strain MA6011, ATCC 53699, in an aqueous nutrient medium containing assimilable sources of carbon, nitrogen and inorganic salts under submerged aerobic conditions and recovering said compound.

4,960,699

ENZYMATIC DEPOLYMERIZATION OF COAL

Willis A. Wood, Cardiff, and Lillian M. Wondrack, San Diego, both of Calif., assignors to Salk Institute Biotechnology/Industrial Associates, Inc., San Diego, Calif.

Filed May 9, 1988, Ser. No. 193,332

Int. Cl.[5] C12R *1/645;* C12P *1/02, 5/00;* C12N *9/08*

U.S. Cl. 435—166 **4 Claims**

1. A method for enzymatically depolymerizing polymeric substituents of coal comprising combining in an aqueous solution, in which a lignin peroxidase is enzymatically active, an aqueous soluble polymeric coal substrate, the lignin peroxidase, hydrogen peroxide and oxygen.

4,960,700

COMPOSITIONS AND METHODS FOR THE SYNTHESIS AND ASSAY OF A MAMMALIAN ENKEPHALINASE

Bernard Malfroy-Camine, San Bruno, and Peter R. Schofield, San Francisco, both of Calif., assignors to Genentech, Inc., So. San Francisco, Calif.

Continuation-in-part of Ser. No. 946,566, Dec. 24, 1986. This application Jan. 12, 1987, Ser. No. 2,478

Int. Cl.[5] C12N *9/48, 9/50, 5/00, 1/22, 15/00, 1/00;* C12P *21/04, 19/34;* C07H *15/12;* C07K *13/00*

U.S. Cl. 435—172.3 **19 Claims**

1. A recombinant DNA selected from the group consisting of:

(a) a rat DNA sequence encoding enkephalinase,

(b) a human DNA sequence encoding enkephalinase, and

(c) a DNA sequence which hybridizes to (a) or (b)

and which encodes a mammalian enkephalinase.

4,960,701

N-ACETYLMANNOSAMINE DEHYDROGENASE, PROCESS FOR ITS PRODUCTION, METHOD FOR QUANTITATIVELY ANALYZING N-ACETYLMANNOSAMINE OR SIALIC ACID, AND KIT FOR THE QUANTITATIVE ANALYSIS

Tatsuo Horiuchi, and Toshiko Kurokawa, both of Noda, Japan, assignors to Noda Institute for Scientific Research, Chiba, Japan

Filed Nov. 17, 1987, Ser. No. 121,916

Claims priority, application Japan, Dec. 4, 1986, 61-287843; Dec. 12, 1986, 61-294711; Dec. 12, 1986, 61-294712

Int. Cl.[5] C12N *9/04*

U.S. Cl. 435—190 **4 Claims**

4. A process for producing the N-acetylmannosamine dehydrogenase which comprises culturing a strain Flavobacterium sp. No. 141-8 (FERM BP-1222) having an ability to produce N-acetylmannosamine dehydrogenase in a culture medium by a method of shaking culture or submerged agitation culture at a temperature of 20° C. to 40° C. for a period of 20 to 40 hours, and collecting N-acetylmannosamine dehydrogenase from the cultured product.

4,960,702

METHODS FOR RECOVERY OF TISSUE PLASMINOGEN ACTIVATOR

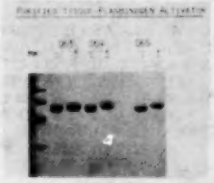
Craig Rice, Alameda; Michael J. Morser; Charles Glaser, both of San Francisco, all of Calif., and Peter A. Donner, Berlin, Fed. Rep. of Germany, assignors to Codon, South San Francisco, Calif.

Continuation-in-part of Ser. No. 76,682, Sep. 6, 1986, abandoned, which is a continuation-in-part of Ser. No. 773,334, Sep. 6, 1985, abandoned. This application Mar. 11, 1988, Ser. No. 167,061

Claims priority, application PCT Int'l Appl., Sep. 6, 1986, 86/0831

Int. Cl.[5] C12N *9/64;* A61K *37/547*

U.S. Cl. 435—226 **46 Claims**



1. A method for recovering intact tissue plasminogen activator (t-PA) form a liquid medium containing said intact t-PA and at least one of degraded t-PA and unrelated proteins comprising the steps of:

(a) contacting said liquid medium with a metal chelate adsorbent substrate selected from divalent cation chelates;
(b) subjecting said metal chelate adsorbent substrate to a first solution which selectively dissociates therefrom degraded t-PA but not said intact t-PA; and
(c) subjecting said metal chelate adsorbent of step b to at least one second solution which selectively dissociates therefrom the intact t-PA.

4,960,703

COMPOSITION FOR IN VITRO MICROPROPAGATION OF PLANTS

Marc Paques, Jambes, and Emile P. Boxus, Brussels, both of Belgium, assignors to Personnalite Juridique de la Station des Cultures Fruitieres et Maraicheres, Gembloux, Belgium

Filed Mar. 23, 1987, Ser. No. 41,427
Claims priority, application Belgium, Apr. 23, 1986, 0/216.580
Int. Cl.[5] C12N *5/00*
U.S. Cl. 435—240.45 **9 Claims**

1. A process for combating vitrification, vitrescence or hyperhydria in the in vitro micropropagation of plants from pre-existing buds, comprising growing the said plants in a culture medium containing an effective amount of agar hydrolysate.

4,960,704

MODIFIED ANTIBIOTIC RESISTANCE GENE

Thomas D. Ingolia; Kevin R. Kaster, and R. Nagaraja Rao, all of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Continuation of Ser. No. 535,508, Sep. 26, 1983, abandoned, which is a continuation-in-part of Ser. No. 533,189, Sep. 19, 1983, abandoned, which is a continuation-in-part of Ser. No. 516,222, Jul. 22, 1983, abandoned. This application May 31, 1988, Ser. No. 205,011
Int. Cl.[5] C12N *1/20, 15/00, 9/12;* **C07H** *15/12*
U.S. Cl. 435—252.33 **56 Claims**

1. A DNA sequence which encodes the amino acid sequence

R_z PRO GLU LEU THR ALA THR SER VAL GLU LYS PHE LEU ILE GLU LYS PHE ASP SER VAL SER ASP LEU MET GLN LEU SER GLU GLY GLU GLU SER ARG ALA PHE SER PHE ASP VAL GLY GLY ARG GLY TYR VAL LEU ARG VAL ASN SER CYS ALA ASP GLY PHE TYR LYS ASP ARG TYR VAL TYR ARG HIS PHE ALA SER ALA ALA LEU PRO ILE PRO GLU VAL LEU ASP ILE GLY GLU PHE SER GLU SER LEU THR TYR CYS ILE SER ARG ARG ALA GLN GLY VAL THR LEU GLN ASP LEU PRO GLU THR GLU LEU PRO ALA VAL LEU GLN PRO VAL ALA GLU ALA MET ASP ALA ILE ALA ALA ALA ASP LEU SER GLN THR SER GLY PHE GLY PRO PHE GLY PRO GLN GLY ILE GLY GLN TYR THR THR TRP ARG ASP PHE ILE CYS ALA ILE ALA ASP PRO HIS VAL TYR HIS TRP GLN THR VAL MET ASP ASP THR VAL SER ALA SER VAL ALA GLN ALA LEU ASP GLU LEU MET LEU TRP ALA GLU ASP CYS PRO GLU VAL ARG HIS LEU VAL HIS ALA ASP PHE GLY SER ASN ASN VAL LEU THR ASP ASN GLY ARG ILE THR ALA VAL ILE ASP TRP SER GLU ALA MET PHE GLY ASP SER GLN TYR GLU VAL ALA ASN ILE PHE PHE TRP ARG PRO TRP LEU ALA CYS MET GLU GLN GLN THR ARG TYR PHE GLU ARG ARG HIS PRO GLU LEU ALA GLY SER PRO ARG LEU ARG ALA TYR MET LEU ARG ILE GLY LEU ASP GLN LEU TYR GLN SER LEU VAL ASP GLY ASN PHE ASP ASP ALA ALA TRP ALA GLN GLY ARG CYS ASP ALA ILE VAL ARG SER GLY ALA GLY THR VAL GLY ARG THR GLN ILE ALA ARG ARG SER ALA ALA VAL TRP THR ASP GLY CYS VAL GLU VAL LEU ALA ASP SER GLY ASN ARG ARG PRO SER THR ARG PRO ARG ALA LYS GLU

wherein
MET is methionine,
LYS is lysine,
PRO is proline,
GLU is glutamic acid,
LEU is leucine,
THR is threonine,
ALA is alamine,
SER is serine,
VAL is valine,
PHE is phenylalanine,
ILE is isoleucine,
GLY is glycine,
ASP is aspartic acid,
GLN is glutamine,
ARG is arginine,
CYS is cysteine,
TRP is tryptophan,
ASN is asparagine,
HIS is histidine,
TYR is tyrosine, and
R is a deoxyribonucleotide triplet that encodes lysine and z=0 to 2; subject to the limitation that said DNA encodes a hygromycin B phosphotransferase that is not encoded by plasmid pKC203.

4,960,705

PROCESS FOR THE FILTRATION OF THICKENED CORN GLUTEN

Peter Johann, Darmstadt, and Georg Winkler, Bad Salzuflen, both of Fed. Rep. of Germany, assignors to Rohm GmbH Chemische Fabrik, Darmstadt, Fed. Rep. of Germany

Filed Jun. 17, 1987, Ser. No. 63,088
Claims priority, application Fed. Rep. of Germany, Jun. 25, 1986, 3621220
Int. Cl.[5] C07K *3/12*
U.S. Cl. 435—272 **7 Claims**

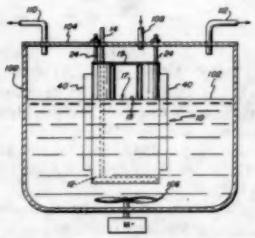
1. A process for filtering thickened corn gluten, comprising the steps of:
(i) adding a filtration improving amount of an enzyme selected from the group consisting of xylanases, hemicellulases, glucanases, and mixtures thereof to the thickened corn gluten, wherein said enzyme is substantially free of amylase and proteinase activity at the pH value of the thickened corn gluten;
(ii) reacting said enzyme and the thickened corn gluten for a period of time sufficient to improve filtration of the gluten, to produce a reacted gluten; and
(iii) filtering said reacted gluten.

4,960,706

STATIC OXYGENATOR FOR SUSPENSION CULTURE OF ANIMAL CELLS

Rudolf F. Bliem, Castro Valley, and James F. Long, San Francisco, both of Calif., assignors to Baxter International, Inc., Deerfield, Ill.

Filed Mar. 27, 1989, Ser. No. 328,629
Int. Cl.[5] C12M *3/00;* **C10J** *1/08*
U.S. Cl. 435—284 **12 Claims**



1. A static apparatus for oxygenating a suspension culture of

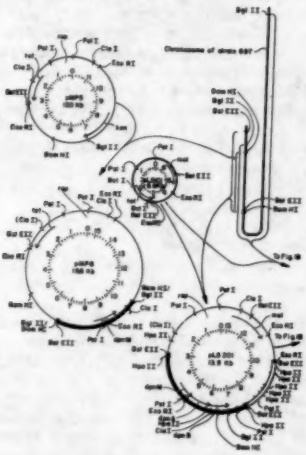
animal cells in a liquid culture medium, comprising a bottom portion comprising generally concentric vertically-oriented inner and outer hollow cylinders, the walls of which are composed of porous gas-permeable, liquid-permeable material, so as to provide between the cylindrical surfaces of said concentric cylinders a hollow annular space adapted to receive oxygen-containing gas and transfer at least a portion of said gas substantially bubble-free across said porous material to a liquid phase in contact with or in proximity to said cylindrical surfaces of said bottom portion; and a top portion comprising vertical extensions of said concentric cylinders which are interrupted at least one area along their circumferential surfaces such that at least one liquid overflow area is defined at the base area at said interrupted surfaces, and such that a continuation of sections of said hollow annular space exists between the vertically-extended surfaces of said concentric cylinders, said continuation of said sections of said hollow annular space being adapted to receive oxygen-containing gas from said hollow annular space of said bottom portion and to release oxygen-containing gas across said porous material above said overflow areas, said apparatus being adapted to be stationarily arranged in a suspension culture vessel and unassociated with means for rotating or vibrating said apparatus.

4,960,707

RECOMBINANT PLASMIDS FOR ENCODING RESTRICTION ENZYMES DPNI AND DPNII OF STREPTOCOCCUS PNEUMONTAE

Sanford A. Lacks, Brookhaven, N.Y., assignor to Associated Universities, Inc., Washington, D.C.

Filed Aug. 17, 1987, Ser. No. 85,944
Int. Cl.[5] C12N *15/00, 9/16, 1/20*
U.S. Cl. 435—320 **6 Claims**



5. A recombinant DNA plasmid comprising a bacterial plasmid which contains a functional DpnI gene segment wherein said plasmid results in the production of DpnI enzyme following the transformation thereof into a bacterial strain suitable for production of DpnI enzyme.

6. A recombinant DNA plasmid comprising a bacterial plasmid which contains a functional DpnII gene segment wherein said plasmid results in the production of DpnII enzyme following the transformation thereof into a bacterial strain suitable for production of DpnII enzyme.

4,960,708

PRESSURIZED PACKAGED REFERENCE LIQUID FOR BLOOD GAS ANALYSIS

John M. Zowtiak, and Bruce I. Mayall, both of Mission Viejo, Calif., assignors to Baxter International Inc., Deerfield, Ill.

Filed Oct. 13, 1988, Ser. No. 257,017
Int. Cl.[5] G01N *31/00*
U.S. Cl. 436—11 **13 Claims**

1. A packaged single-phase reference liquid, which comprises:

(a) a sealed, flexible, gas- and liquid-impermeable container, and

(b) an aqueous solution contained in said container without any gas phase, said solution containing a known concentration of oxygen or carbon dioxide or both, wherein the sum of the partial pressures of oxygen and carbon dioxide are less than about 350 mm Hg (at 37° C.), said solution further containing a highly diffusible gas at a concentration such that the total gas pressure is from about 550 to about 800 mm Hg (at 37° C.), and wherein the total hydraulic pressure within the container is greater than the total gas pressure and is sufficient to prevent a gas phase separation during conditions of storage and use.

4,960,709

KIT FOR USE IN THE DETERMINATION OF THE PROLIFERATIVE ACTIVITY IN HUMAN TUMOURS

Rosella Silvestrini, Milan, Italy, assignor to Istituto Nazionale Per Lo Studio E La Cura Dei Tumori, Milan, Italy

Filed Jan. 29, 1987, Ser. No. 8,260
Claims priority, application Italy, Jan. 31, 1986, 19249 A/86
Int. Cl.[5] G01N *33/48*
U.S. Cl. 436—64 **4 Claims**

4. A method of obtaining a stabilized specimen containing tumoral tissue for determination of the tumor proliferative activity, which consists of providing a kit consisting essentially of a first vial which contains in lyophilized form McCoy's 5A culture medium, 190 U.I. of penicillin, 190 ug of streptomycin, fetal calf serum and a radioactive metabolic precursor, which is 3H-thymidine, a second vial containing distilled water, a third vial which contains a fixative agent, a fourth vial which contains ethyl alcohol, a container for waste liquids and means for the aspiration and transfer of said liquids, adding the distilled water from said second vial to the lyophilized product in said first vial, after one hour adding a sample of the tumoral tissue to said first vial, removing the liquid after a suitable time period by transfer to said container, introducing the fixative agent from said third vial into said first vial, removing liquid after a suitable time period, introducing ethyl alcohol from said fourth vial into said first vial whereby a stabilized test specimen is obtained and measuring the labeling index by the autoradiographic method.

4,960,710

DEVICE AND METHOD OF ASSAYING FOR TRACE MOUNTS OF PROTEINS

Arthur L. Lau, Granger, Ind., assignor to Miles Inc., Elkhart, Ind.

Filed Jun. 6, 1988, Ser. No. 202,552
Int. Cl.[5] G01N *33/48*
U.S. Cl. 436—86 **16 Claims**

12. A method of detecting and/or differentiating concentrations of protein in a liquid sample at protein concentration levels in the range of 0–2000 mg/dL:

(a) contacting the liquid sample with an analyte detection device comprising a reagent test pad containing a reagent composition comprising a water-soluble tungstate; a polyhydroxybenzenesulfonephthalein-type dye; and a nonchelating buffer to maintain the reagent composition at an acidic pH; and

(b) examining the analyte detection device for a color transi-

tion in response to the protein content of the liquid test sample.

13. An analyte detection device to determine the presence and/or concentration of protein in a liquid test sample at protein concentration levels in the range of 0–2000 mg/dL comprising:

a support strip;

a reagent test pad; and

a reagent composition incorporated into the reagent test pad, said reagent composition comprising a water-soluble tungstate; a polyhydroxybenzenesulfonephthalein-type dye and/or a polyhydroxybenzenephthalein-type dye; and a nonchelating buffer to maintain the reagent composition at an acidic pH.

4,960,711

METHOD FOR THE QUANTITATIVE DETERMINATION OF TRIHALOMETHANES

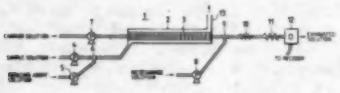
Toyoaki Aoki; Kouji Kawakami, both of Osaka; Yoshiharu Tanaka, and Hiroshi Hoshikawa, both of Kanagawa, all of Japan, assignors to Fuji Electric Co., Ltd., Japan

Filed Jan. 30, 1989, Ser. No. 303,221

Claims priority, application Japan, Jan. 30, 1988, 63-21061; Jan. 17, 1989, 1-8302

Int. Cl.[5] G01N *33/18, 1/00;* **C02F** *1/42, 1/76*

U.S. Cl. 436—124 **6 Claims**



1. A method for determining a quantity of trihalomethanes present in a sample containing interfering substances, comprising the steps of:

flowing a sample solution through a first channel in a membrane separator;

flowing a carrier solution through a second channel in the membrane separator, the first and the second channels being in contact with each other via pores of a microporous membrane that will not react with the trihalomethanes present, the bores having a size sufficient to filter at least a portion of the interfering substances and to allow pressure of the trihalomethanes;

heating the carrier solution that has passed through the membrane separator and to which an alkaline nicotinamide or a derivative thereof has been added;

cooling the carrier solution; and

determining the quantity of trihalomethanes in the solution by subjecting the cooled solution to fluorimetry.

4,960,712

SYSTEM AND METHOD FOR COMPLEMENT PATHWAY ANALYSIS

Argyrios N. Theofilopoulos; Frank J. Dixon, both of La Jolla, and Maria-Teresa Aguado-Celada, Encinitas, all of Calif., assignors to Scripps Clinic and Research Foundation, La Jolla, Calif.

Continuation of Ser. No. 552,158, Nov. 15, 1983. This application Jun. 30, 1988, Ser. No. 213,312

Int. Cl.[5] G01N *33/566*

U.S. Cl. 436—501 **28 Claims**

1. A method of determining the fragments of a complement component in a sample comprising the steps of:

(a) binding a plurality of specific binding agents to the complement component fragments in the sample, each binding agent being specific to a different fragment of the complement component;

(b) measuring the amount of binding by each specific binding agent to its respective fragments to obtain a value for each agent;

(c) correlating the values determined in step (b) from which is calculated a value for the amount of a particular complement component fragment present in the sample, the particular fragment being other than those fragments corresponding to the specific binding agents.

4,960,713

DIAGNOSTIC TEST METHODS

Susan G. Hadfield, and Franklin E. A. Norrington, both of Beckenham, England, assignors to Burroughs Wellcome Co., Research Triangle Park, N.C.

Division of Ser. No. 769,597, Aug. 26, 1985, Pat. No. 4,475,075. This application Feb. 25, 1988, Ser. No. 160,148

Claims priority, application United Kingdom, Sep. 6, 1984, 22512; Jul. 10, 1985, 17477

The portion of the term of this patent subsequent to May 17, 2005, has been disclaimed.

Int. Cl.[5] G01N *33/53, 33/545, 33/577*

U.S. Cl. 436—523 **24 Claims**

1. A method of testing for the presence of three ligands in an aqueous liquid medium comprising the steps of:

A. mixing a sample of the said medium with a reagent comprising a mixture of polymer latex particles collectively of three colors, the particles of the first of said three colors having attached thereto antibody selectively bindable to the first of said three ligands, the particles of the second of said three colors having attached thereto antibody selectively bindable to the second of said three ligands and the particles of the third of said three colors having attached therto antibody selectively bindable to the third of said three colors,

whereby the presence of the first of said three ligands in the sample is indicated by the selective agglutination of the particles of the first of said three colors having attached thereto the antibody selectively bindable to the first of said three ligands, the presence of the second of said three ligands in the sample is indicated by the selective agglutination of the particles of the second of said three colors having attached thereto the antibody selectively bindable to the second of said three ligands and the presence of the third of said three ligands in the sample is indicated by the selective agglutination of the particles of the third of said three colors having attached thereto the antibody selectively bindable to the third of said three ligands;

B. after an appropriate period of time, inspecting the mixture resulting from step A; and

C. determining the presence of three ligands from the appearance of said mixture.

13. A test reagent for determining the presence of three ligands in a sample of an aqueous liquid medium which comprises

a mixture of polymer latex particles collectively of three colors, the particles of the first of said three colors having attached thereto antibody selectively bindable to the first of said three ligands, the particles of the second of said three colors having attached thereto antibody selectively bindable to the second of said three ligands and the particles of the third of said three colors having attached thereto antibody selectively bindable to the third of said three ligands,

whereby the presence of the first of said three ligands in the sample is indicated by the selective agglutination of the particles having attached thereto the antibody selectively bindable to the first of said three ligands, the presence of the second of said three ligands in the sample is indicated by the selective agglutination of the particles having attached thereto the antibody selectively bindable to the second of said three ligands and the presence of the third of said three ligands in the sample is indicated by the selective agglutination of the particles having attached

thereto the antibody selectively bindable to the third of said three ligands.

4,960,714

DIAGNOSTIC TEST METHODS

Hadfield Susan G., and Franklin E. A. Norrington, both of Beckenham, England, assignors to Burroughs Wellcome Co., Research Triangle Park, N.C.

Division of Ser. No. 769,597, Aug. 26, 1985, Pat. No. 4,475,075. This application Feb. 25, 1988, Ser. No. 160,149

Claims priority, application United Kingdom, Sep. 6, 1984, 8422512; Jul. 10, 1985, 8517477

The portion of the term of this patent subsequent to May 17, 2005, has been disclaimed.

Int. Cl.[5] **G01N** *33/53, 33/545, 33/577*

U.S. Cl. 436—523 **24 Claims**

1. A method of testing for the presence of two ligands in an aqueous liquid medium comprising the steps of:

A. mixing a sample of the said medium with a reagent comprising a mixture of polymer latex particles collectively of two colors, the particles of the first of said two colors having attached thereto antibody selectively bindable to the first of said two ligands and the particles of the second of said two colors having attached thereto antibody selectively bindable to the second of said two ligands,

whereby the presence of the first of said two ligands in the sample is indicated by the selective agglutination of the particles having attached thereto the antibody selectively bindable to the first of said two ligands and the presence of the second of said two ligands in the sample is indicated by the selective agglutination of the particles having attached thereto the antibody selectively bindable to the second of said two ligands;

B. after an appropriate period of time, inspecting the mixture resulting from step A; and

C. determining the presence of two ligands from the appearance of said mixture.

13. A test reagent for determining the presence of two ligands in a sample of an aqueous liquid medium which comprises

a mixture of polymer latex particles collectively of two colors, the particles of the first of said two colors having attached thereto antibody selectively bindable to the first of said two ligands and the particles of the second of said two colors having attached thereto antibody selectively bindable to the second of said two ligands,

whereby the presence of the first of said two ligands in the sample is indicated by the selective agglutination of the particles having attached thereto the antibody selectively bindable to the first of said two ligands and the presence of the second of said two ligands in the sample is indicated by the selective agglutination of the particles having attached thereto the antibody selectively bindable to the second of said two ligands.

4,960,715

DIAGNOSTIC TEST METHODS

Susan G. Hadfield, and Franklin E. A. Norrington, both of Beckenham, England, assignors to Burroughs Wellcome Co., Research Triangle Park, N.C.

Division of Ser. No. 769,597, Aug. 26, 1985, Pat. No. 4,745,075. This application Feb. 25, 1988, Ser. No. 161,014

Claims priority, application United Kingdom, Sep. 6, 1984, 8422512; Jul. 10, 1985, 8517477

The portion of the term of this patent subsequent to May 17, 2005, has been disclaimed.

Int. Cl.[5] **G01N** *33/53, 33/545, 33/577*

U.S. Cl. 436—523 **18 Claims**

1. A method of testing for the presence of a ligand in an aqueous liquid medium comprising the steps of:

A. mixing a sample of the said medium with a reagent comprising particles of a first colour having attached thereto a first monoclonal antibody bindable to the said ligand, in admixture with particles of a second colour having attached thereto a second monoclonal antibody obtained from a cell line derived from a non-inoculated animal of the same species as that from which was derived the cell line from which the said first monoclonal antibody was obtained,

whereby non-specific interaction between the said sample and the said reagent is indicated by agglutination of both the said particles of the first colour and the said particles of the second colour and the presence of the said ligand in the said sample, free from said non-specific interaction, is indicated by agglutination of the said particles of the first colour alone;

B. after an appropriate period of time, inspecting the mixture resulting from step A.; and

C. determining the test result from the appearance of the said mixture.

10. A test reagent for the presence of a ligand in a sample of an aqueous liquid medium, said reagent comprising

particles of a first colour having attached thereto a first monoclonal antibody bindable to the said ligand, in admixture with

particles of a second colour having attached thereto a second monoclonal antibody obtained from a cell line derived from a non-inoculated animal of the same species as that from which was derived the cell line from which the said first monoclonal antibody was obtained,

whereby non-specific interaction between the said sample and the said reagent is indicated by agglutination of both the said particles of the first colour and the said particles of the second colour and the presence of the said ligand in the said sample, free from said non-specific interaction, is indicated by agglutination of the said particles of the first colour alone.

4,960,716

MONOCLONAL ANTIBODIES SPECIFIC FOR 330 KD BREAST TUMOR ANTIGEN AND ASSAY USING SAID MONOCLONAL ANTIBODIES

Michael A. Harvey, Painted Post; Brenda D. Manning; Mary L. Nicholson, both of Corning; Karen L. Travis, Corning, all of N.Y., and Albert A. Luderer, Marshfield, Mass., assignors to Ciba Corning Diagnostics Corp., Medfield, Mass.

Continuation of Ser. No. 10,710, Feb. 4, 1987, abandoned, which is a continuation of Ser. No. 605,853, May 1, 1984, abandoned. This application Dec. 28, 1988, Ser. No. 290,852

Int. Cl.[5] **A61K** *39/395;* **C07K** *15/28;* **G01N** *33/536, 33/574*

U.S. Cl. 436—542 **12 Claims**

1. A method for detecting the presence of breast cancer in a patient, which comprises:

(a) contacting a sample of a patient fluid with: (i) an immobilized antibody which binds to the about 330,000 dalton glycoprotein found on epithelial cell membranes; (ii) a first monoclonal antibody produced from hybridoma cell line 21DD5, for a time sufficient for the first monoclonal antibody to bind to its determinant on the glycoprotein, to form a first immune complex; and (iii) a second monoclonal antibody produced from hybridoma cell line 21DD7, for a time sufficient for the second monoclonal antibody to bind to its determinant on the glycoprotein, to form a second immune complex;

(b) measuring the amount of the first immune complex formed and the amount of the second immune complex formed; and

(c) determining the presence of breast cancer from the measurement in (b).

4,960,717

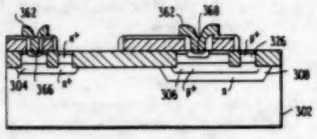
FABRICATION OF DIELECTRICALLY ISOLATED INTEGRATED CIRCUIT DEVICES

Victor J. Silvestri, Hopewell Junction, and Paul J. Tsang, Poughkeepsie, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 106,210, Oct. 1, 1987, Pat. No. 4,908,691, which is a division of Ser. No. 793,612, Oct. 31, 1985, Pat. No. 4,728,624. This application Aug. 19, 1988, Ser. No. 234,058

Int. Cl.[5] H01L *21/265*

U.S. Cl. 437—33 1 Claim



1. A method of fabricating dielectrically isolated integrated circuit devices, comprising the following steps:

(*i*) forming a plurality of isolation regions in a monocrystalline silicon substrate by ion implantation;

(ii) forming a first plurality of subcollector regions in said substrate by ion implantation;

(iii) forming, by ion implantation, a second plurality of subcollector regions of a second conductivity type different from said first conductivity type, said second plurality of subcollector regions having said isolation regions formed thereunder;

(iv) growing an oxide layer over said substrate after said step (ii), wherein said step (*i*) and said forming of said second plurality of subcollectors in said step (iii) are performed after said step (iv);

(v) etching first regions in said oxide layer over at least said first plurality of subcollector regions such that at least portions of said first plurality of subcollector regions are exposed; and

(vi) forming NPN and PNP transistors in said first regions, wherein remaining portions of said oxide layer between adjacent ones of said first regions constitute interdevice isolation regions.

4,960,718

MESFET DEVICE HAVING A SEMICONDUCTOR SURFACE BARRIER LAYER

Olaleye A. Aina, Columbia, Md., assignor to Allied-Signal Inc., Morris Township, Morris County, N.J.

Division of Ser. No. 808,920, Dec. 13, 1985, abandoned. This application Jul. 5, 1988, Ser. No. 218,506

Int. Cl.[5] H01L *21/265, 21/338*

U.S. Cl. 437—22 10 Claims

1. A method of fabricating a semiconductor device on a semi-insulating InP substrate, comprising the steps of:

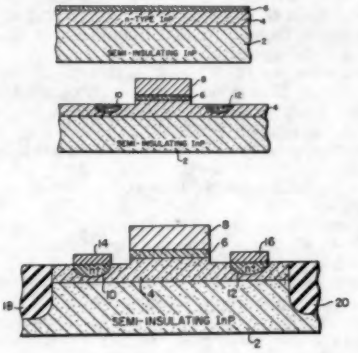
(a) forming an active layer in the InP substrate;

(b) forming a semiconductor surface barrier layer in the active layer by implanting an element selected from the group of Ga and Al;

(c) forming a gate electrode on a portion of the semiconductor surface barrier layer, the barrier height across the interface of the gate electrode and the semiconductor surface barrier layer being higher than the barrier height across an interface of the gate electrode and the active region;

(d) removing selected portions of the semiconductor surface barrier layer;

(e) forming source and drain regions on selected portions of the surface of the active layer where the semiconductor surface barrier layer has been removed; and



(f) annealing the semiconductor device at a temperature of at least 700° C.

4,960,719

METHOD FOR PRODUCING AMORPHOUS SILICON THIN FILM TRANSISTOR ARRAY SUBSTRATE

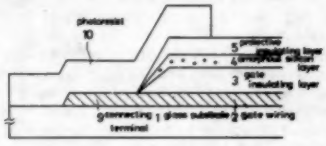
Sakae Tanaka, and Yoshiaki Watanabe, both of Tokyo, Japan, assignors to Seikosha Co., Ltd., Tokyo, Japan

Filed Jan. 23, 1989, Ser. No. 300,629

Claims priority, application Japan, Feb. 4, 1988, 63-24729; Feb. 10, 1988, 63-29181; Feb. 10, 1988, 63-29182

Int. Cl.[5] H01L *21/312*

U.S. Cl. 437—40 2 Claims

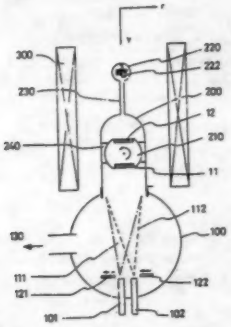


1. In a method for producing an amorphous silicon thin film transistor array substrate comprising successively coating a gate insulating layer, an amorphous silicon layer and a protective insulating layer on a glass substrate provided with a gate electrode and a gate wiring having a predetermined shape, in such a manner as to not cover the terminal region at the end of the gate wiring, said terminal being used for connecting the array to an external circuit, patterning said protective insulating layer into a predetermined shape, and then after passing through a predetermined production process including etching, providing at least an amorphous silicon thin film transistor array, a gate wiring and source wiring, the improvement comprising covering said terminal region at the end of said gate wiring and exposed regions of said glass substrate with a photoresist during said step of patterning said protective insulating layer, and maintaining said photoresist on said terminal region of said gate wiring and exposed regions of said glass substrate during said etching to protect said terminal region at the end of said gate wiring and said exposed region of said glass substrate.

4,960,720
METHOD OF GROWING COMPOUND SEMICONDUCTOR THIN FILM USING MULTICHAMBER SMOOTHING PROCESS

Masafumi Shimbo, 31-1, Kameido 6-chome, Koto-ku, Tokyo, Japan

Filed Aug. 24, 1987, Ser. No. 88,948
Claims priority, application Japan, Aug. 26, 1986, 61-199281
Int. Cl.[5] H01L *21/203, 21/324*
U.S. Cl. 437—105 **6 Claims**

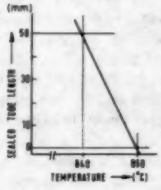


1. A method of growing stoichiometric compound semiconductor composed of first and second constituent particles, comprising the steps of: heating a substrate while maintaining the substrate in a first vacuum chamber; depositing a thin layer of first constituent particles on the heated substrate by molecular beam deposition in the first vacuum chamber; transporting the heated substrate having the thin layer deposited thereon from the first vacuum chamber to a second vacuum chamber while maintaining a thermal equilibrium state within the second vacuum chamber; and thereafter contacting the thin layer with a vapor of second constituent particles in the second vacuum chamber while controlling both the pressure of the vapor and the temperature of the substrate to promote reaction between the thin layer and the vapor to thereby effect growth of a stoichiometric compound semiconductor composed of the first and second constituent particles.

4,960,721
METHOD FOR PURIFYING GROUP II–IV COMPOUND SEMICONDUCTORS

Kazutaka Terashima; Masaru Kawachi, and Hiroaki Yoshida, all of Kanagawa, Japan, assignors to Kabushiki Kaisha Toshiba, Kanagawa, Japan

Filed Nov. 9, 1988, Ser. No. 268,926
Claims priority, application Japan, Nov. 10, 1987, 62-282129; Nov. 16, 1987, 62-287291; Dec. 24, 1987, 62-325450; Aug. 22, 1988, 63-207527
Int. Cl.[5] H01L *21/00, 21/02, 21/26, 21/203*
U.S. Cl. 437—247 **22 Claims**



1. A method for removing impurities from a Group II–VI compound semiconductor, comprising the steps of:
providing said compound semiconductor in a sealed container having a high-temperature zone and a low-temperature zone, said semiconductor being disposed in the high-temperature zone;
providing at least one transporter adjacent said semiconductor in the high temperature zone of the sealed container, said transporter being either a group II element or a Group VI element, or a mixture of elements selected from either Group II or Group VI or from both Groups II and VI; and
providing heat to the sealed container such that the temperature of the high-temperature zone is maintained higher than the temperature of the lower temperature zone of the sealed container for generating an atmosphere of the transporter to transport impurities in said semiconductor from the high-temperature zone to the low-temperature zone of the container.

4,960,722
SENSOR USING A FIELD EFFECT TRANSISTOR AND METHOD OF FABRICATING THE SAME

Kazufumi Ogawa, Hirakata, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Division of Ser. No. 900,629, Aug. 26, 1986, Pat. No. 4,881,109. This application May 15, 1989, Ser. No. 353,326
Claims priority, application Japan, Aug. 29, 1985, 60-190772; Aug. 29, 1985, 60-190776
Int. Cl.[5] H01L *21/265*
U.S. Cl. 437—40 **5 Claims**

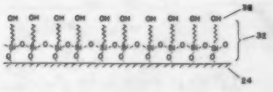


FIG. 5

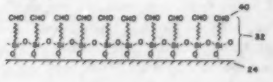
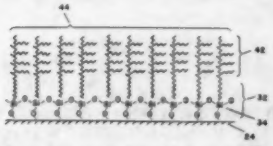


FIG. 6



1. A method for making a sensor comprising the steps of:
forming a field effect transistor on a semiconductor substrate, said field effect transistor having a gate electrode;
forming a photoresist layer on said semiconductor substrate except the portion of said gate electrode;
forming a reactive monomolecular film on the surface of said gate electrode, said reactive monomolecular film being formed by means of silane surface active agent having a reactive group;
transforming the reactive group of said silane surface active agent into a hydroxyl group;
transforming said hydroxyl group into an aldehyde group;
fixing a sensing material made of proteins or enzymes to said aldehyde group; and
removing said photoresist layer.

4. A method for making a sensor comprising the steps of:
forming a field effect transistor on a semiconductor substrate, said field effect transistor having a gate electrode;
forming a hydrophilic polymer photosensitive thin film having a sensing group on said semiconductor substrate;
removing said hydrophilic polymer photosensitivie thin film from said semiconductor substrate except the portion on

said gate electrode by use of a mask having an opening which corresponds to said gate electrode;

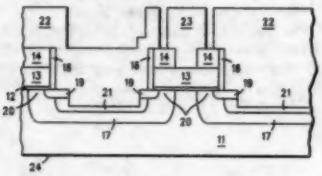
transforming the sensing group of said hydrophilic high polymer photosensitive thin film into an aldehyde group; and fixing a sensing material composed of protein or enzyme to said aldehyde group.

4,960,723

PROCESS FOR MAKING A SELF ALIGNED VERTICAL FIELD EFFECT TRANSISTOR HAVING AN IMPROVED SOURCE CONTACT

Robert B. Davies, Tempe, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Mar. 30, 1989, Ser. No. 330,850
Int. Cl.[5] H01L *21/335*
U.S. Cl. 437—41 **7 Claims**



1. An improved method for making a vertical field effect transistor having a silicon substrate which serves as a drain, a polysilicon gate formed on one surface of the silicon substrate, and a source formed in the silicon substrate, the improvement comprising the steps of: forming a silicon nitride sidewall spacer covering an edge of the gate; forming an oxide sidewall spacer covering the silicon nitride sidewall spacer; etching a portion of the source using the oxide sidewall spacer as an etch mask thereby producing an exposed portion of the silicon substrate; and removing the oxide sidewall spacer.

4,960,724

METHOD FOR DELETING UNUSED GATES AND METHOD FOR MANUFACTURING MASTER-SLICE SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE USING THE DELETING METHOD

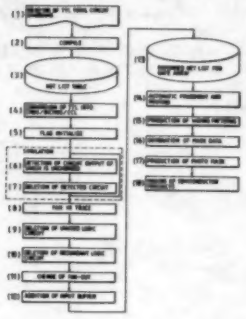
Shoichi Watanabe; Takayuki Takei, both of Takasaki; Terumine Hayashi, Hitachi, and Takashi Natabe, Ibaragi, all of Japan, assignors to Hitachi, Ltd. and Hitachi Microcomputer Engineering Ltd., both of Tokyo, Japan

Filed Jul. 11, 1989, Ser. No. 378,143
Claims priority, application Japan, Jul. 21, 1988, 63-182712
Int. Cl.[5] H01L *21/70*
U.S. Cl. 437—51 **5 Claims**

1. A method for deleting unused gates for use in converting first total circuit diagrams formed of a plurality of integrated circuit devices into second total circuit diagrams adapted for forming a single-chip semiconductor integrated circuit device, the method comprising the steps of:

(1) specifying first circuit points to be used as external terminals for outputting signals and second circuit points to be used as external terminals for inputting signals of said semiconductor integrated circuit device on said first total circuit diagrams;

(2) tracing signal transmitting paths between said first circuit points and said second circuit points starting from said first circuit points and advancing toward said second circuit points to thereby detect logic gates included in said signal transmitting paths; and



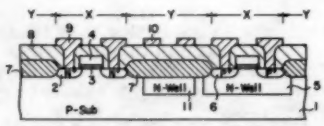
(3) forming said second total circuit diagrams by deleting logic gates other than those detected in said step (2) from said first total circuit diagrams.

4,960,725

SEMICONDUCTOR DEVICE AND MANUFACTURING PROCESS FOR PROVIDING DEVICE REGIONS ON THE SEMICONDUCTOR DEVICE AND ISOLATION REGIONS TO ISOLATE THE DEVICE REGIONS FROM EACH OTHER.

Tatsuo Noguchi, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Division of Ser. No. 910,684, Sep. 23, 1986, abandoned. This application Jul. 19, 1988, Ser. No. 222,314
Claims priority, application Japan, Sep. 25, 1985, 60-211557
Int. Cl.[5] H01L *21/00, 29/84*
U.S. Cl. 437—57 **1 Claim**



1. A manufacturing process for a semiconductor device comprising CMOS transistor regions and isolation regions to isolate said CMOS transistor regions from each other on a semiconductor substrate, said process comprising the steps of:

forming a first impurity buried layer in one of said CMOS transistor regions of said semiconductor substrate;

forming a second impurity buried layer in one of said isolation regions of said semiconductor substrate so that said first and second impurity buried layers are isolated from each other, said first and second impurity buried layers having an opposite conductivity type to said semiconductor substrate;

forming a field insulator on said second impurity buried layer in said one of said isolation regions;

forming individual integrated layers in order to constitute respective CMOS transistors in said CMOS transistor regions; and

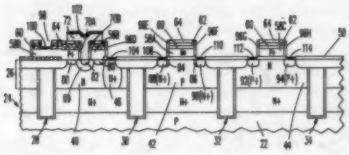
forming a conductive layer for wiring said individual integrated layers on said field insulator.

4,960,726

BICMOS PROCESS

John S. Lechaton, and Dominic J. Schepis, both of Wappingers Falls, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 19, 1989, Ser. No. 424,363
Int. Cl.[5] H01L 21/70
U.S. Cl. 437—59 10 Claims



1. A method comprising the steps of:
providing a substrate of semiconductor material including at least first and second electrically isolated device regions;
forming a first layer of insulating material conformally over said substrate;
patterning said first layer to expose a surface portion of said second device region;
forming a second layer of conductive material generally conformally over said first and second device regions, said second layer spaced from the surface of said first device region by said first layer and said second layer contacting the surface of said second device region;
forming an aperture in said second layer over said second device region;
removing portions of said second layer to leave a base contact on the surface of said second device region and a separate gate contact insulated from the surface of said first device region by said first layer;
said step of forming said aperture performed before said removing step;
forming a field-effect transistor having a channel region underlying said gate contact in said first device region; and
forming a vertical bipolar transistor having a base region contacting said base contact in said second device region.

4,960,727

METHOD FOR FORMING A DIELECTRIC FILLED TRENCH

Robert Mattox, Tempe, Ariz., and Steven Fong, Santa Clara, Calif., assignors to Motorola, Inc., Schaumburg, Ill.

Division of Ser. No. 122,086, Nov. 17, 1987, Pat. No. 4,825,277.
This application Nov. 18, 1988, Ser. No. 274,512
Int. Cl.[5] H01L 21/76
U.S. Cl. 437—67 5 Claims

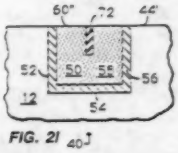


FIG. 2

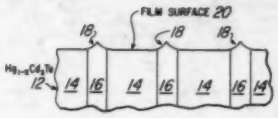
1. A method for forming an isolation wall in a semiconductor device, comprising:
providing a semiconductor substrate having a surface;
forming a trench having a sidewall and a bottom extending into said substrate from said surface;
conformally filling said trench with a silicon oxy-nitride;
covering said silicon oxy-nitride in said trench with a silicon nitride layer; and
etching a central seam extending into said oxy-nitride in said trench and then filling said seam and completely covering the upper surface of said oxy-nitride in said trench with silicon nitride.

4,960,728

HOMOGENIZATION ANNEAL OF II-VI COMPOUNDS

Herbert F. Schaake, Denton, and Roland J. Koestner, Richardson, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 104,122, Oct. 5, 1987, abandoned. This application Oct. 11, 1988, Ser. No. 257,141
Int. Cl.[5] H01L 21/324, 21/263
U.S. Cl. 437—82 20 Claims



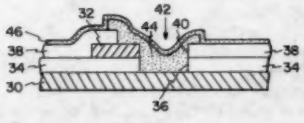
1. A homogenization anneal process for group II–VI compound semiconductor films, comprising the steps of:
(a) providing a substrate of a first group II–VI semiconductor material;
(b) providing a film of a second group II–VI semiconductor material on said substrate at a temperature below about 300 degrees C.; and
(c) annealing said substrate with said film thereon at a temperature in trhe range of from about 300 to about 450 degrees C. for the time to provide lateral homogenization of said film but limited interdiffusion of said film and substrate.

4,960,729

INTEGRATED CIRCUITS AND A METHOD FOR MANUFACTURE THEREOF

Zvi Orbach, and Meir I. Janai, both of Haifa, Israel, assignors to Elron Electronic Industries Ltd., Haifa, Israel

Continuation of Ser. No. 166,371, Mar. 10, 1988, abandoned.
This application Dec. 7, 1989, Ser. No. 449,389
Claims priority, application Israel, Mar. 10, 1987, 81849
Int. Cl.[5] H01L 21/283
U.S. Cl. 437—101 15 Claims



1. A technique for providing a direct radiation formable conductive link between first and second metal layers in an integrated circuit comprising the steps of:
providing a first patterned metal layer on a substrate;
providing an insulation layer over first patterned metal layer;
providing a second patterned metal layer over said insulation layer;
forming an aperture in said insulation layer through which adjacent, non-contacting portions of said first patterned metal layer and said second patterned metal layer are exposed; and
after completion of all preceding steps, providing a layer of

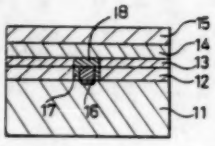
amorphous silicon contacting said first and second pattern metal layers at said aperture.

4,960,730

METHOD OF MAKING A SEMICONDUCTOR LIGHT EMITTING DEVICE USING OUT-DIFFUSION FROM A BURIED STRIPE

Syoichi Kakimoto, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 216,832, Jul. 8, 1988, Pat. No. 4,888,782.
This application Sep. 25, 1989, Ser. No. 411,748
Claims priority, application Japan, Jul. 16, 1987, 62-179346
Int. Cl.[5] H01L *21/203, 21/225*
U.S. Cl. 437—129 9 Claims



1. A method of producing a buried stripe semiconductor light emitting device in which the buried stripe functions as an internal resonator, and window regions are interposed between end surfaces of the resonator and facets on the external surface of the light emitting device, the method comprising the steps of:

conducting a first phase crystal growth in which a first cladding layer is grown on a doped substrate;

introducing a doped stripe of impurities into the first cladding layer in electrical contact with the doped substrate, the doped stripe extending longitudinally but terminating short of the facet for forming said window regions;

conducting a second phase crystal growth to bury the doped stripe internal of the semiconductor light emitting device, the second phase crystal growth including growing an active layer, a second cladding layer and a contact layer successively over the first cladding layer; and

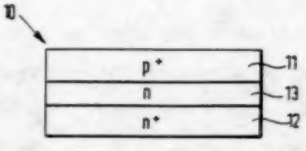
out-diffusing impurities from the doped stripe into the active layer to the boundary between the active layer and the second cladding layer to form the resonator, the out-diffused impurities forming an internal semiconductor junction between the resonator and second cladding layer having undoped window regions in the active layer intermediate the resonator and the facets.

4,960,731

METHOD OF MAKING A POWER DIODE WITH HIGH REVERSE VOLTAGE RATING

Richard Spitz, and Vesna Biallas, both of Reutlingen, Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Apr. 27, 1989, Ser. No. 344,295
Claims priority, application Fed. Rep. of Germany, May 7, 1988, 3815615
Int. Cl.[5] H01L *21/22*
U.S. Cl. 437—152 16 Claims



1. Method of making a high-reverse-voltage-rated power diode from a disk-shaped monocrystalline semiconductor body (10) having two major surfaces, onto each of which is applied respectively as a doping substance one of boron and phosphorus, after which, in a first diffusion step, said doping substances are driven into said semiconductor body (10) to a predetermined diffusion depth by heating said semiconductor body to a predetermined temperature,

wherein, to lower the forward voltage drop of the diode, the lifetime of the charge carriers is increased by gettering,

said gettering being carried out in a first diffusion step and a second diffusion step following said first diffusion step;

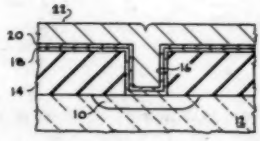
said second diffusion step being carried out at a temperature sufficiently reduced, with respect to the temperature of said first diffusion step, to avoid significantly influencing depth of diffusion of said doping substances into said semiconductor body.

4,960,732

CONTACT PLUG AND INTERCONNECT EMPLOYING A BARRIER LINING AND A BACKFILLED CONDUCTOR MATERIAL

Pankaj Dixit, Sunnyvale; Jack Sliwa, Los Altos Hills; Richard K. Klein; Craig S. Sander, both of Mountain View, and Mohammad Farnaam, Santa Clara, all of Calif., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Division of Ser. No. 16,429, Feb. 19, 1987, Pat. No. 4,884,123.
This application Nov. 14, 1989, Ser. No. 436,399
Int. Cl.[5] H01L *21/44, 21/48*
U.S. Cl. 437—192 37 Claims



1. A process for fabricating stable, low resistance contacts in an integrated semiconductor circuit which comprises:

(a) providing doped regions in a semiconductor substrate;

(b) forming at least one insulating layer over said doped regions in the surrounding substrate;

(c) forming contact holes of substantially uniform size through said at least one insulating layer in selected areas of said doped regions, said holes defined by walls of said insulating layer;

(d) forming an adhesion and contacting layer of titanium at least in said holes, including along said walls, in contact with the underlying doped region, said adhesion and contacting layer formed to a thickness insufficient to fill said contact holes;

(e) forming a barrier layer in contact with said adhesion and contacting layer, said barrier layer formed to a thickness insufficient to fill said contact holes; and

(f) forming a contact plug comprising a conductive material which substantially fills said contact holes and which is in contact with said barrier layer.

4,960,733

INORGANIC BIOMATERIAL AND PROCESS FOR PRODUCING THE SAME

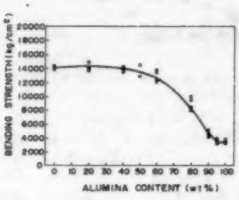
Toshihiro Kasuga; Masahiro Yoshida; Tomoko Uno, all of Akishima, and Kiichi Nakajima, Kokubunji, all of Japan, assignors to Hoya Corporation, Tokyo, Japan

Filed Feb. 24, 1988, Ser. No. 159,606

Claims priority, application Japan, Feb. 28, 1987, 62-46476; Nov. 30, 1987, 62-302817

Int. Cl.[5] C03C *10/12, 10/04, 10/06, 10/08*

U.S. Cl. 501—10 2 Claims



1. An inorganic biomaterial comprising a ceramic-crystallized glass composite wherein a zirconia-alumina ceramic, in a weight ratio of zirconia to alumina in the range from 99.7:0.3 to 10:90, is dispersed in a crystallized glass consisting essentially of the following components in the following proportions:

CaO	12 to 56% by weight
P_2O_5	1 to 27% by weight
SiO_2	22 to 50% by weight
MgO	0 to 34% by weight
Al_2O_3	0 to 25% by weight

in a total amount of at least 90% by weight, and the volume ratio of the crystallized glass to the zirconia-alumina ceramic is in a range from 5:95 to 95:5.

4,960,734

CERAMIC COMPOSITE AND PROCESS FOR PREPARATION THEREOF

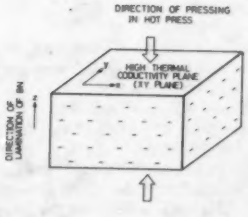
Takao Kanai; Kei Tanemoto; Hiroshi Kubo, and Toyohiko Sato, all of Kawasaki, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Continuation-in-part of Ser. No. 247,263, Sep. 21, 1988, abandoned. This application Jul. 5, 1989, Ser. No. 376,909

Claims priority, application Japan, Sep. 22, 1987, 62-236207; Dec. 28, 1987, 62-329626; May 18, 1988, 63-119236; Jun. 3, 1988, 63-135562

Int. Cl.[5] C04B *35/58*

U.S. Cl. 501—98 24 Claims



1. A ceramic sintered body consisting essentially of hexagonal boron nitride (h-BN), aluminum nitride (AlN) and unavoidably formed aluminum oxynitride (AlON) if any, and a sintering aid and/or a reaction product of the sintering aid with said h-BN, AlN and AlON, the total amount of the sintering aid and the reaction product being 0.01 to 5 parts by weight per 100 parts by weight of the sum of h-BN, AlN, and AlON, wherein the sintered body comprises AlN and AlON in a total amount of 5 to 80% by weight with 20 to 95% by weight of h-BN having an average grain size of at least 1 μm, a degree of anisotropy of the thermal conductivity of the sintered body being at least 2, and wherein the direction of the maximum thermal conductivity is perpendicular to the direction of the minimum thermal conductivity.

4,960,735

ALUMINA-ZIRCONIA-SILICON CARBIDE-MAGNESIA CERAMICS

Pankaj K. Mehrotra, and Elizabeth R. Billman, both of Greensburg, Pa., assignors to Kennametal Inc., Latrobe, Pa.

Filed Nov. 3, 1988, Ser. No. 266,714

The portion of the term of this patent subsequent to Sep. 25, 2007, has been disclaimed.

Int. Cl.[5] C04B *35/56*

U.S. Cl. 501—89 21 Claims

1. An alumina based ceramic composition consisting essentially of:

about 1.5 to 32.5 v/o of carbide whiskers selected from the group consisting of silicon carbide whiskers, titanium carbide whiskers, alone or in combination;

about 5 to 17.5 v/o zirconia;

a residue of a magnesia addition added in the amount of about 0.03 to 3 v/o;

alumina forming essentially the remainder of said composition;

wherein said whiskers, said zirconia and said residue of said magnesia addition are substantially homogeneously dispersed in a matrix formed of said alumina; and

wherein at least about 2.0 v/o of said ceramic composition is tetragonal zirconia.

4,960,736

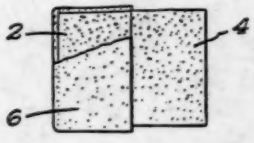
SURFACE BONDING OF CERAMIC BODIES

Stanley J. Luxzez, Hockessin, and Andrew W. Urquhart, New Castle, both of Del., assignors to Lanxide Technology Company, LP, Newark, Del.

Continuation-in-part of Ser. No. 39,510, Apr. 17, 1981, Pat. No. 4,824,008, which is a continuation-in-part of Ser. No. 907,930, Sep. 16, 1986, abandoned. This application Mar. 22, 1989, Ser. No. 327,022

Int. Cl.[5] C03B *35/44*

U.S. Cl. 501—127 27 Claims



1. A method of bonding ceramic bodies along substantially congruent surfaces, comprising:

(a) providing a first body of ceramic, said first body comprising a ceramic product formed by the oxidation reaction of molten parent metal and an oxidant and grown as molten metal is transported through, and oxidized on, the surface of its own previously formed oxidation reaction product, said ceramic body comprising a polycrystalline oxidation reaction product and interconnected residual metal;

(b) assembling said first body of ceramic adjacent a second body of ceramic in a manner such that a pair of bonding surfaces of said first and second bodies to be bonded together face one another;

(c) disposing at least one filler material between at least a portion of said pair of bonding surfaces;

(d) heating the assembled ceramic bodies in the presence of an oxidant to a temperature above the melting point of said residual metal but below the melting point of the oxidation reaction product to be formed and below the melting point of the first and second body of ceramic, to induce transport of said residual metal toward the bonding surface of said first body of ceramic to permit the oxidation of said residual metal on said bonding surface to continually form oxidation reaction product which grows into and embeds said filler material as said residual metal is transported through, and oxidized on, the surface of its own previously formed oxidation reaction product; and

(e) continuing said oxidation of said residual metal until said oxidation reaction product contacts at least a portion of the bonding surface of said second body of ceramic thereby effecting a bond between said ceramic bodies.

4,960,737

CALCIUM DIALUMINATE/HEXALUMINATE CERAMIC STRUCTURES

Donald L. Guile, Horseheads, and Dandy Martin, Corning, both of N.Y., assignors to Corning Incorporated, Corning, N.Y.

Filed Sep. 6, 1988, Ser. No. 241,914
Int. Cl.[5] C04B *35/44*
U.S. Cl. 501—125 41 Claims

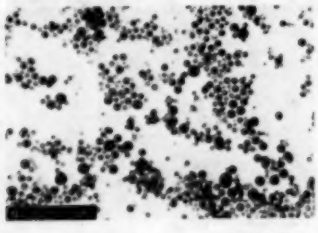
7. A structure comprised of calcium dialuminate and calcium hexaluminate phases of about 75–10% by weight calcium dialuminate and about 25–90% by weight calcium hexaluminate, said structure being produced by sintering a substantially homogeneous blend of a calcium oxide source and an aluminum oxide source of about 11–19% by weight calcium oxide and about 81–89% by weight aluminum oxide, wherein a single or a plurality of dialuminate zones are positionally juxtaposed to a single or a plurality of hexaluminate zones.

4,960,738

MULLITE-ALUMINA COMPOSITE SINTERED BODY AND PROCESS FOR PRODUCING THE SAME

Saburo Hori, Tokyo, and Ryuichi Kurita, Iwaki, both of Japan, assignors to Kureha Chemical Industry Co., Ltd., Tokyo, Japan

Filed Oct. 25, 1988, Ser. No. 262,305
Claims priority, application Japan, Nov. 2, 1987, 62-277800
Int. Cl.[5] C04B *35/00*
U.S. Cl. 501—128 7 Claims



(×35000)

1. A mullite-alumina composite sintered body comprising 77 to 85 wt % Al_2O_3, the balance being SiO_2,

the sintered body having two crystalline phases of mullite and α-phase alumina and being free from any glass phase,

the average diameters of mullite grains and α-phase alumina grains being not more than 1.0 μm,

the content of grains having a longitudinal length of not less than 2.5 μm being 1% or less upon observation of a cross-section of the sintered body, and

the porosity of the sintered body being 1% or less.

4,960,739

METHOD FOR PRODUCING A MATERIAL FOR USE IN A MICROWAVE DIELECTRIC RESONATOR

Keisuke Kageyama, Egawa, Japan, assignor to Sumitomo Special Metal Co., Ltd., Japan

Continuation of Ser. No. 213,718, Apr. 22, 1988, abandoned, which is a continuation-in-part of Ser. No. 82,911, Aug. 10, 1987, abandoned, which is a continuation-in-part of Ser. No. 740,530, Jun. 3, 1985, abandoned. This application Feb. 8, 1990, Ser. No. 478,715

Claims priority, application Japan, Jun. 8, 1984, 59-118907
Int. Cl.[5] C04B *35/46*
U.S. Cl. 501—137 6 Claims

1. A method of producing a dielectric material for use in a microwave dielectric resonator which includes the steps of (1) providing a mixture of initial ingredients from which a dielectric material containing 78.1 mol % TiO_2, 15.7 to 17.8 mol % BaO and 4.00 mol% SnO_2 can be produced, (2) providing a mixture of final ingredients by adding at least one compound selected from the group consisting of $SrCO_3$ and $CaCO_3$ to the mixture of initial ingredients so that the produced dielectric material will include at least one of 0.1 to 1.0 mol% SrO and 0.1 to 1.2 mol % CaO, the dielectric material thereby having a permittivity of about 38 and a temperature coefficient of resonance frequency of between −25 ppm/° C. and +10 ppm/° C., (3) drying and calcining the mixture of final ingredients, (4) crushing, drying, pelletizing compacting and firing the dried and calcined mixture of final ingredients to form the dielectric material.

4,960,740

ORGANOPHILIC CLAY COMPOSITIONS

Roy F. House, Houston, Tex.; Victor M. Granquist, Beaufort, S.C., and Jack C. Cowan, Lafayette, La., assignors to Venture Innovations, Inc., Houston, Tex.

Continuation-in-part of Ser. No. 124,171, Nov. 23, 1987, Pat. No. 4,843,048. This application May 22, 1989, Ser. No. 355,329
Int. Cl.[5] C04B *33/02*
U.S. Cl. 501—148 9 Claims

1. An organophilic clay composition consisting essentially of an adduct of a smectite clay which exhibits osmotic swelling and commercial lecithin, said commercial lecithin comprising from about 30% to about 50% of vegetable oil, from about 35% to about 70% of one or more phosphatides having the empricial formula

$$R_1—CO—O—CH_2—CH(R_2)—CH_2—Q$$

where: R_1 is an aliphatic group containing from about 15 to about 17 carbon atoms; R_2 is selected from the group consisting of R_1COO and $OP(O)(O^-zM^{a+})OZ$; Q is selected from the group consisting of R_1COO and $OP(O)O^-zM^{a+})OZ$; Z is selected from the group consisting of xM^{a+}, $C_6H_6(OH)_5$, and $CH_2—CH(Y)—N(R_3)(R_5)_y(A^{b-})_v$; Y is selected from the group consisting of H and $COO(wM^{a+})$; R_3, R_4, and R_5 are independently selected from the group consisting of H, CH_3, and R_1CO; M is a cation selected from the group consisting of H, an alkali metal, an alkaline earth metal, ammonium, and mixtures thereof; A is an anion of valence b; y=0 or 1; w, x and z=0 or 1/a where a is the valence of M; v=0 or 1/b; and Q is R_1COO only when R_2 is $OP(O)(O^-zM^{a+})OZ$; and from 0% to about 18% of other phosphatides, wherein the weight ratio of said commercial lecithin to said smectite clay is at least about 0.5.

4,960,741

ZIEGLER-NATTA CATALYST

Jean-Claude A. Bailly, and Stylianos Sandis, both of Lavera, France, assignors to BP Chemicals Limited, London, United Kingdom

Filed Feb. 22, 1989, Ser. No. 313,467
Claims priority, application France, Mar. 3, 1988, 88 02900
Int. Cl.[5] C08F *4/02, 4/649*
U.S. Cl. 502—10 **10 Claims**

1. Catalyst of the Ziegler-Natta type, capable of being applied to the polymerization of olefins, comprising a preactivated support containing from 80 to 95 mol% of magnesium chloride and from 5 to 20 mol% of at least one electron-donor compound, D_1, containing no labile hydrogen and no ester function and consisting of spherical particles which have a mass average diameter of 10 to 100 microns and a particle size distribution such that the ratio of the mass average diameter, Dm, to the number average diameter, Dn, is below 2, and characterized in that the catalyst containing from 4 to 12% of titanium atoms per atom of magnesium is prepared by a process comprising:

(a) treating the said preactivated support by placing it in contact with at least one electron-donor compound D_2 containing labile hydrogen,

(b) impregnating the support thus treated by placing it in contact with titanium tetrachloride, then washing the impregnated support with liquid hydrocarbon and,

(c) subjecting the support thus impregnated and thus washed to a treatment of activation which consists in placing it in contact with titanium tetrachloride.

4,960,742

SPENT ANTIMONY HALIDE CATALYSTS TREATMENT

William H. Gumprecht, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Oct. 26, 1988, Ser. No. 262,637
Int. Cl.[5] B01J *38/54;* C01G *30/00;* C22B *30/02;* B08B *9/08*
U.S. Cl. 502—24 **5 Claims**

1. A process for treating spent antimony halide catalysts preparatory to regeneration or disposal comprising contacting said spent catalysts with an amount of methylene chloride effective to dissolve and/or disperse the spent antimony halide catalyst, said spent antimony halide catalysts comprising mixtures of antimony pentachloride, antimony trichloride, antimony chlorofluorides, arsenic chloride and fluorides, chlorinated hydrocarbons, chlorofluorinated hydrocarbons and corrosion products, and thereafter,

recovering or disposing of said dissolved and/or dispersed spent antimony halide catalyst.

4,960,743

METHOD FOR PRODUCTION OF CATALYST CARRIER FOR POLYMERIZATION OF OLEFIN

Masahide Murata; Masafumi Imai; Hiroyuki Furuhashi; Kouji Maruyama, and Hiroshi Ueno, all of Saitama, Japan, assignors to Toa Nenryo Kogyo KK, Tokyo, Japan

Filed Nov. 18, 1988, Ser. No. 273,397
Claims priority, application Japan, Nov. 30, 1987, 62-300073
The portion of the term of this patent subsequent to Mar. 21, 2006, has been disclaimed.
Int. Cl.[5] C08F *4/64*
U.S. Cl. 502—121 **5 Claims**

1. A magnesium-containing carrier for use in olefin polymerizations obtained by contacting (A) magnesium metal and (B) a halogenated hydrocarbon represented by the general formula, RX wherein R stands for an alkyl, aryl, or cycloalkyl group having 1 to 20 carbon atoms and X stands for a halogen atom, and thereafter contacting the contact product of (A) and (B) with (C) an alkoxy compound of the general formula, $X_n^1M(OR^1)_{m-n}$ wherein X^1 stands for a hydrogen atom, a halogen atom, or a hydrocarbon group having 1 to 20 carbon atoms, M stands for a boron, carbon, aluminum, silicon, or a phosphorus atom, R^1 stands for a hydrocarbon group having 1 to 20 carbon atoms, and m stands for the valency of said atom M, providing that $m<n\leqq 0$ is satisfied, and contacting the product therefrom with (D) a halogen-containing alcohol.

4,960,744

CATALYST SYSTEM FOR THE POLYMERIZATION OF PROPYLENE AND PROCESS

Laurent Duranel, Pau, and Roger Spitz, Serezin du Rhone, both of France, assignors to Atochem, France

Filed Oct. 8, 1985, Ser. No. 785,795
Claims priority, application France, Oct. 16, 1984, 84 15843
Int. Cl.[5] C08F *4/51, 4/654, 10/06*
U.S. Cl. 502—127 **7 Claims**

1. A catalyst composition for the polymerization of propylene comprising a catalytic solid consisting essentially of a mixture of $MgCl_2$ and a first Lewis base on which a tetravalent titanium halide is impregnated and a cocatalytic component associated therewith consisting essentially of isoprenyl aluminum alone or with a second Lewis base the same as or different than said first Lewis base; said Lewis bases being aromatic esters.

4,960,745

LAYERED ALUMINUM COMPOUNDS CONTAINING PHOSPHORUS OR ARSENIC AND PENDANT ORGANIC GROUPS

Ivy D. Johnson, Medford, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Jul. 20, 1989, Ser. No. 382,444
Int. Cl.[5] B01J *31/14*
U.S. Cl. 502—150 **16 Claims**

1. A solid composition of matter comprising layered oxides comprising aluminum together with phosphorus or arsenic and a monovalent organic group, these layered compounds having one of the formulae:

$Al_xORAO_3.nS$

or

$Al_xOROAO_3.nS$

where A is phosphorus or arsenic, S is a solvent molecule, R is an alkyl or aryl group or a mixture thereof, $0.5\leqq X\leqq 2.0$ and n is zero or a positive number, said R groups being covalently bound to an A atom in the oxide layer directly through either carbon or oxygen.

9. A process for preparing a composition comprising layered oxides comprising aluminum together with phosphorus or arsenic and a monovalent organic group, these layered compounds having one of the formulae:

$Al_xORAO_3.nS$

or

$Al_xOROAO_3.nS$

where A is phosphorus or arsenic, S is a solvent molecule, R is an alkyl or aryl group or a mixture thereof, $0.5\leqq X\leqq 2.0$ and n is zero or a positive number, said R groups being covalently bound to an A atom in the oxide layer directly through either carbon or oxygen, said process comprising contacting an aluminum compound with an effective amount of a phosphonic, phosphoric, arsonic or arsenic acid or mixture thereof substituted with said R group, said contacting taking place in the presence of a solvent, said process further comprising heating the resultant mixture at temperature ranging from about 50° C. to the reflux temperature of the reaction medium until the product is detected in isolatable amounts, said process further comprising recovering the product.

4,960,746

LIQUID PHOTOINITIATOR MIXTURES

Rinaldo Hüsler, Marly; Werner Rutsch, Fribourg; Manfred Rembold, Aesch, and Franciszek Sitek, Therwil, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 122,816, Nov. 19, 1987, abandoned. This application Jul. 26, 1989, Ser. No. 386,015

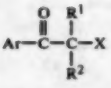
Claims priority, application Switzerland, Nov. 26, 1986, 4734/86; Feb. 5, 1987, 416/87

Int. Cl.[5] B01J *31/02*

U.S. Cl. 502—153 **17 Claims**

1. A liquid photoinitiator mixture, comprising

(A) 70–99.9% by weight of at least one liquid photoinitiator of the formula I or of a liquid mixture of metal-free photoinitiators containing at least one compound of the formula I

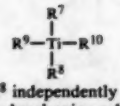


(I)

in which Ar is a phenyl group which is unsubstituted or is monosubstituted or polysubstituted by halogen, C_1–C_{18}-alkyl, C_3–C_{12}-alkenyl, C_1–C_{12}-alkoxy, allyloxy, phenoxy, C_1–C_{18}-alkylthio, allylthio, 2-hydroxyethylthio, phenylthio, tolylthio, C_1–C_{12}-alkylamino, C_2–C_{24}-dialkylamino, C_4–C_8-bis(hydroxyalkyl)-amino, diallylamino, bis-(2-methoxyethyl)amino, morpholino, piperidino or pyrrolidino, R^1 and R^2 independently of one another are C_1–C_8-alkyl or C_1–C_4-alkyl which is substituted by —OH, C_1–C_4-alkoxy, benzyloxy, —CN, —COO(C_1–C_8-alkyl), (C_1–C_4-alkyl)—COO—, C_2–C_8-dialkylamino or morpholino, or R^1 and R^2 together are C_3–C_9-alkanediyl, C_3–C_9-oxa- or -aza-alkanediyl or C_5–C_9-alkenediyl, X is a group —OR^3 or , in which R^3 is hydrogen, C_1–C_8-alkyl, C_2–C_4-alkyl which is substituted by halogen, —OH or C_1–C_4-alkoxy, allyl, benzyl, 2-tetrahydropyranyl, trimethylsilyl or phenyl-dimethylsilyl, R^4 and R^5 independently of one another are hydrogen, C_1–C_{12}-alkyl, C_2–C_4-alkyl which is substituted by —OH, C_1–C_4-alkoxy, —CN or —COO(C_1–C_4-alkyl), allyl, benzyl or cyclohexyl, or R^4 and R^5 together are C_3–C_7-alkylene which can be interrupted by —O—or —$N(R^6)$—, R^6 being hydrogen, C_1–C_4-alkyl, allyl, benzyl or C_2–C_4-hydroxyalkyl, and

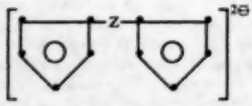
(B) 0.5–20% by weight of at least one titanocene photoinitiator, selected from

(B_1) compounds of the formula II



(II)

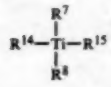
in which R^7 and R^8 independently of one another are a cyclopentadienyl or indenyl anion which is unsubstituted or is substituted by C_1–C_4-alkyl, chlorine, phenyl or cyclohexyl, or R^7 and R^8 together are a divalent bis-cyclopentadienyl anion of the formula III



(III)

in which Z is methylene, dimethylene or trimethylene, C_2–C_{12}-alkylidene, C_5–C_7-C -cycloalkylidene, —$Si(R^{11})(R^{12})$— or —$Sn(R^{11})_2$-and R^{11} and are C_1–C_{12}-alkyl, phenyl or benzyl, R^9 is the monovalent radical of a 6-membered carbocyclic or 5-membered or 6-membered heterocyclic aromatic ring which is substituted by fluorine in at least one ortho-position relative to the bond to the Ti atom and can also be monosubstituted or polysubstituted by halogen, C_1–C_{12}-alkyl, C_1–C_{14}-alkoxy, —$O(CH_2CH_2O)_{1\text{-}20}$–$C_1$–$C_{14}$-alkyl, C_2–C_{10}-alkoxycarbonyl, aminocarbonyl having up to 12 C atoms or by a primary, secondary or tertiary amino or aminoalkyl group having up to 20 C atoms or a quaternary ammonium or ammonium alkyl group having up to 30 C atoms, R^{10} is as defined for R^9 or is C_2–C_{12}-alkynyl, phenylalkynyl which has 2–5 C atoms in the alkyne radical and is unsubstituted or substituted in the phenyl radical by halogen or C_1–C_{14}-alkyl, or is halogen or a group —$Si(R^{11})_3$, —$Si(R^{11})_2(R^{12})$, —$Sn(R^{11})_3$, —OH, C_1–C_{10}-alkox C_6–C_{10}-aryloxy, unsubstituted or halogen-substituted C_2–C_6-acyloxy, -N_3, —CN, —NCO or —NCS, or R^9 and R^{10} together are a radical of the formula —Q—Y—Q—, in which Q is a carbocyclic or 5-membered or 6-membered heterocyclic aromatic ring which is bonded to the titanium atom in the 2-position relative to the Y group and is substituted by fluorine in the 3-position and, as further substituents, can contain C_1–C_4alkyl, halogen, C_1–C_4-alkoxy, di-(C_1–C_4-alkyl)-amino or a quaternary C_3–C_{20}-ammonium group, Y is methylene, C_2–C_{12}-alkylidene, C_5–C_7-cycloalkylidene, a direct bond or a group —NR^{13}—, —O—, —S—, —SO—, —SO_2—, —CO—, —$Si(R^{11})(R^{12})$— or —$Sn(R^{11})_2$- and R^{13} is hydrogen, C_1–C_{12}-alkyl, cyclohexyl, phenyl, tolyl or benzyl, or

(B_2) compounds of the formula IV



(IV)

in which R^7 and R^8 are as defined above, R^{14} is the monovalent radical of a 6-membered carbocyclic or 5-membered or 6-membered heterocyclic aromatic ring which is substituted by —CF_3 in at least one ortho-position relative to the bond to the Ti atom and can also be monosubstituted or polysubstituted by halogen, C_1–C_{12}-alkyl, C_1–C_{14}-alkoxy, -$O(CH_2CH_2O)_{1\text{-}20}$-$C_1$–$C_{14}$-alkyl, C_2–C_{10}-alkoxycarbonyl or aminocarbonyl or by a primary, secondary or tertiary amino or aminoalkyl group having up to 20 C atoms or a quaternary ammonium or ammonium alkyl group having up to 30 C atoms, and R^{15} is as defined for R^{14} or is C_2–C_{12}-alkynyl, phenylalkynyl which has 2–5 C atoms in the alkyne radical and is unsubstituted or substituted in the phenyl radical by halogen or C_1–C_4-alkyl, or is halogen or a group —$Si(R^{11})_3$, —$Si(R^{11})_2(R_{12})$, —$Sn(R^{11})_3$,-OH, C_1–C_{10}alkoxy, C_6–C_{10}-aryloxy, unsubstituted or halogen-substituted C_2–C_6-acyloxy, —N_3, —CN, —NCO or —NCS.

4,960,747

CATALYST COMPOSITION CONTAINING DIPHOSPHINES HAVING HETEROCYCLIC SUBSTITUENTS

Johannes A. Van Doorn; Richard L. Wife, and Petrus H. M. Budzelaar, all of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Division of Ser. No. 233,793, Aug. 19, 1988, Pat. No. 4,880,902. This application Aug. 14, 1989, Ser. No. 393,196

Claims priority, application Netherlands, Aug. 27, 1987, 8702003

Int. Cl.[5] B01J *31/04*

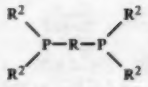
U.S. Cl. 502—167 **9 Claims**

1. A catalyst composition useful for polymerizing carbon monoxide and olefinically unsaturated compounds, comprising:

(a) a palladium compound,

(b) an anion of an acid with a pKa of less than 6, and

(c) a diphosphine of the general formula



wherein each R^2 is independently a similar or different carbocyclic hydrocarbon group, or a similar or different heterocyclic substituent having one or more oxygen, sulphur, or nitrogen atoms in a five or six membered ring selected from 2-pyridyl, 2-furyl or 2-thienyl groups, which substituent is bound to the phosphorus atom by one of the carbon atoms in the ring of the substituent, at least one R^2 being the heterocyclic substituent, and wherein R represents a bivalent bridging group containing at least one carbon atom in the bridge.

4,960,748

ALUMINA PHOSPHATED WITH PARTIAL ESTER

Douglas D. Klendworth, and Max P. McDaniel, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jul. 20, 1987, Ser. No. 75,457
Int. Cl.[5] C08F *4/24, 10/00*
U.S. Cl. 502—210 **19 Claims**

1. A method of making a treated alumina composition which comprises:

(a) heating an alumina-containing material at a temperature in the range of about 450° to about 900° C., for a time in the range of about one minute to about 48 hours; and

(b) treating the thus heated material with an alcohol solution of a partial phosphate ester to give a phosphated alumina-containing material, wherein said partial phosphate ester comprises a mixture of mono- and dialkyl phosphate esters produced by combining phosphorous pentoxide with an alcohol.

4,960,749

SET FOR PRODUCING A COLORED PATTERN

Satoshi Miura; Masato Nishimura; Shigeki Itoh, and Takashi Asari, all of Yao, Japan, assignors to Matsumoto Yushi-Seiyaku Co., Ltd., Osaka, Japan

Filed Jun. 28, 1988, Ser. No. 212,695
Int. Cl.[5] B41M *5/22*
U.S. Cl. 503—213 **9 Claims**

1. A set for producing a colored pattern, which comprises:

an ink composition comprising a colorless electron donative chromophoric compound, a solvent and/or plasticizer, and a solidifying material, said ink composition capable of being softened by the pressure and temperature of a digit, and

an acid sheet.

4,960,750

RECORDING SHEET HAVING IMPROVED COHESION AND ADHESION OF MICROCAPSULES

William A. Hammann, IV; Rong-Chang Liang, both of Centerville; Teresa M. Thomas, Springfield, and Jesse Hipps, Sr., Miamisburg, all of Ohio, assignors to The Mead Corporation, Dayton, Ohio

Filed Mar. 14, 1989, Ser. No. 323,526
Int. Cl.[5] B41M *5/22*; G03C *1/40, 1/00*
U.S. Cl. 503—214 **20 Claims**

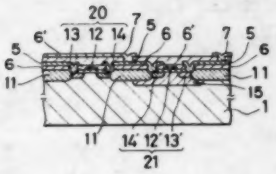
1. A recording sheet which comprises a substrate having a layer of a, metal on the surface thereof and a layer of microcapsules containing an image-forming agent on the surface of said metal layer, said microcapsules having moieties on the surface thereof or being contained in a binder having moieties which are reactively bonded to a crosslinking agent to provide improved cohesion of said layer of microcapsules.

4,960,751

ELECTRIC CIRCUIT HAVING SUPERCONDUCTING MULTILAYERED STRUCTURE AND MANUFACTURING METHOD FOR SAME

Shunpei Yamazaki, Tokyo, Japan, assignor to Semiconductor Energy Laboratory Co., Ltd., Atsugi, Japan

Filed Mar. 29, 1988, Ser. No. 174,790
Claims priority, application Japan, Apr. 1, 1987, 62-81487; Feb. 1, 1988, 63-22384
Int. Cl.[5] H05K *1/00*
U.S. Cl. 505—1 **5 Claims**



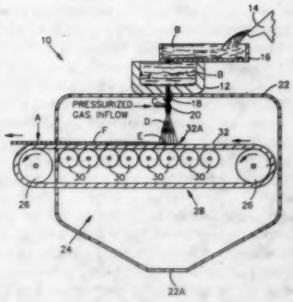
1. A superconducting pattern formed on a substrate coated with an insulating film made of an oxide, characterized in that said pattern is made of a copper oxide superconducting ceramic comprising rare earth and alkaline earth elements and that said pattern is prevented by an intervening non-oxide film, selected from the group comprising silicon nitride, aluminum nitride, titantium nitride, silicon carbide, titanium carbide, diamond-like carbon and diamond from being in direct contact with said insulating film.

4,960,752

PROCESS TO PRODUCE ORIENTED HIGH TEMPERATURE SUPERCONDUCTORS

Sankaranarayanan Ashok, Bethany, and William G. Watson, Cheshire, both of Conn., assignors to Olin Corporation, New Haven, Conn.

Filed Feb. 27, 1989, Ser. No. 315,864
Int. Cl.[5] H01L *39/12*
U.S. Cl. 505—1 **43 Claims**



1. A method for manufacturing a polycrystalline superconductor having oriented anisotropic properties from an oxygen deficient precursor having a desired stoichiometric composition, comprising the steps of:

(a). atomizing said precursor into supercooled droplets and directing said atomized precursor onto a ceramic substrate;

(b). solidifying said droplets on said ceramic substrate, such that the droplets flatten out upon impact and oriented crystal growth occurs;

(c). removing said structure from said ceramic substrate; and

(d). oxidizing said structure to form a polycrystalline superconductor having oriented anisotropic properties.

4,960,753

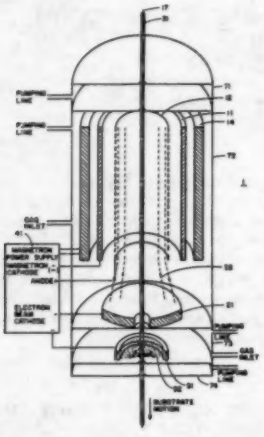
MAGNETRON DEPOSITION OF CERAMIC OXIDE-SUPERCONDUCTOR THIN FILMS

George J. Collins, 807 W. Oak St., Fort Collins, Colo. 80521; John R. McNeil, 13423 Desert Hills NE., Albuquerque, N. Mex. 87111, and Zeng-gi Yu, North Aggie Village Apt. 7C, C.S.U., Fort Collins, Colo. 80523

Division of Ser. No. 79,879, Jul. 29, 1987, Pat. No. 4,842,704. This application Jun. 26, 1989, Ser. No. 372,268

Int. Cl.[5] **C23C** *14/34, 14/56;* **H01L** *39/24*

U.S. Cl. 505—1 **7 Claims**



1. Apparatus for depositing a superconducting thin film of metal oxide ceramic materials onto the outer surface of a substrate, the apparatus comprising;

first and second vacuum chamber means;

means for positioning a substrate within said first and second vacuum chamber means;

a cylindrical magnetron positioned within said first vacuum chamber means, the cylindrical magnetron having a longitudinal axis that is substantially coincident with a longitudinal axis of the substrate, having a cylindrical anode coaxially positioned with respect to the substrate, having a cylindrical cathode of diameter greater than that of the cylindrical anode and coaxially positioned with respect to the substrate and the cylindrical anode, and having a cylindrical solenoid of diameter greater than that of the cylindrical cathode and coaxially positioned with respect to the substrate, the cylindrical cathode, and the cylindrical anode;

a disc-shaped cold cathode positioned within the first vacuum chamber means and having an axis that is substantially coincident with the longitudinal axis of the substrate, the disc-shaped cold cathode being positioned proximate to one end of the cylindrical magnetron and being operative for providing a beam of energetic electrons for injection into a plasma region of the cylindrical magnetron;

a ring-shaped cold cathode positioned within the second vacuum chamber means and having an axis that is substantially coincident with the longitudinal axis of the substrate, the ring-shaped cold cathode being positioned proximate to one end of the cylindrical magnetron and being operative for providing a disc-shaped beam of electrons impinging upon the outer surface of the substrate for thermally annealing the superconducting thin film deposited thereon;

power supply means for applying selected operating voltages to the cylindrical cathode, cylindrical anode, cylindrical solenoid, disc-shaped cold cathode, and ring-shaped cold cathode;

vacuum control means, including differential pumping means, coupled to the first and second vacuum chamber means for establishing and maintaining desired vacuum levels within the first and second vacuum chamber means; and

gas port means coupled to the vacuum control means and first and second vacuum chamber means for selectively admitting and controlling the flow of one or more selected reactive feedstock gases into the first and second vacuum chamber means.

4,960,754

3,7-DIMETHYL-6,7-DIOXO-1,3-OCTADIENE DERIVATIVES AND ORGANOLEPTIC USES THEREOF

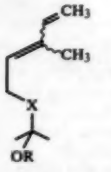
Richard A. Wilson, Westfield; Michael J. Zampino, Roselle Park; Braja D. Mookherjee, Holmdel; Robert W. Trenkle, Brielle; Anton Van Ouwerkerk, Livingston; Myrna L. Hagedorn, Edison, and Michael G. Monteleone, Lyndhurst, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Continuation-in-part of Ser. No. 2,017, Jan. 9, 1987, abandoned. This application Dec. 8, 1989, Ser. No. 447,848

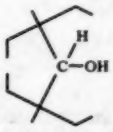
Int. Cl.[5] **A61K** *7/46*

U.S. Cl. 512—25 **6 Claims**

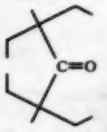
2. A process for augmenting or enhancing the aroma of a perfume composition, perfumed article or cologne comprising the step of adding to said perfume composition, perfumed article or cologne, an aroma augmenting or enhancing quantity of at least one 3,7-dimethyl-6,7-dioxo-1,3-octadiene defined according to the structure:



wherein R is selected from the group consisting of hydrogen and ethyl; wherein X is a moiety selected from the group consisting of:



and



and wherein each of the wavy lines represents a "E" or "Z" configuration of the vinyl or methyl moieties about the 3,4-pi-bond.

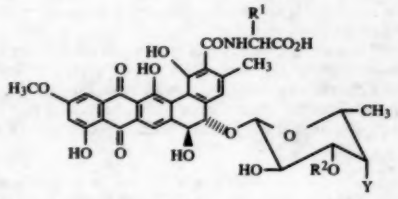
4,960,755

BU-3608 DERIVATIVES

Maki Nishio, Tokyo; Masatoshi Kakushima, Yokohama; Masataka Konishi, Kawasaki, and Toshikazu Oki, Yokohama, all of Japan, assignors to Bristol-Myers Company, New York, N.Y.

Filed Jul. 19, 1988, Ser. No. 221,144
Int. Cl.[5] A61K *37/10, 31/70;* C07H *15/24*
U.S. Cl. 514—8 12 Claims

1. A compound having the formula



II

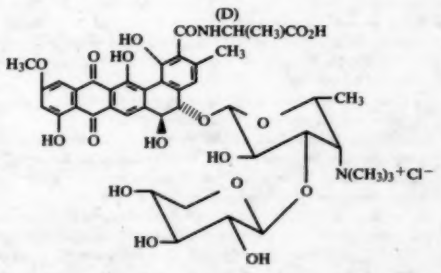
wherein

R^1 is H, or R^1 is methyl and the resulting alanyl is D-alanyl;

R^2 is H or β-D-xylosyl; and

Y is NR^3R^4 or $^+NR^3R^4R^5\ X^-$; wherein R^3, R^4 and R^5, are the same or different C_{1-5}alkyl; and X^- is a chloride ion; or a pharmaceutically acceptable salt thereof.

7. The compound of claim 1 having the formula



(D)

11. A method for treating fungal infection in a mammalian host which comprises administering to said host an antifungal amount of a compound of claim 1 or claim 7.

4,960,756

LECTIN LIKE PROTEIN SUBSTANCE, METHOD OF OBTAINING SAME AND ANTI-TUMOR AGENT COMPRISING SAME

Shunji Natori, Tone, Japan, assignor to Sanwa Kagaku Kenkyusho Co., Ltd., Nagoya, Japan

Filed Aug. 28, 1987, Ser. No. 90,730
Claims priority, application Japan, Sep. 13, 1986, 61-216158
Int. Cl.[5] A61K *37/10;* C07K *3/00*
U.S. Cl. 514—8 1 Claim

1. A method for obtaining an anti-tumor, physicoactive substance having haemagglutination and lectin like activities from a cell culture medium wherein said substance co-exists with an inhibitor thereof, said substance:

(a) having a molecular weight of about 185,000 as determined by gel filtration; and

(b) having four subunits with a molecular weight of about 32,000 and two subunits with a molecular weight of about 30,000 as determined by SDS-PAGE; said method comprising:

(1) dialyzing a supernatant liquid of a culture medium of a cell line established from *Sarcophaga peregrina* against 10 mM phosphate buffer, pH6;

(2) chromatographing said dialyzed liquid on a CMC ion-exchange column, eluting with phosphate buffer, solution, pH 6.0;

(3) combining the eluates from step (2), and adding saturated ammonium sulfate to prepare a 20 (w/v)% solution;

(4) introducing said solution onto a chromatography column packed with butyl-toyopearl 650M and washing with phosphate buffered 20% ammonium sulfate solution to remove said inhibitor;

(5) eluting the column with 10% ammonium sulfate solution and collecting the fractions;

(6) dialyzing the collected fractions against buffered insect saline;

(7) purifying the dialyzed fractions by affinity chromatography on a column packed with Sepharose 6B having a ligand selected from the group consisting of galactose, lactose and mixtures thereof; and

(8) eluting the collected adsorptive with buffered insect saline and fractionating the elute containing the substance.

4,960,757

PASTEURIZED HUMAN FIBRINOGEN (HF), A PROCESS FOR ITS PREPARATION, AND ITS USE

Gerhardt Kumpe, Wetter; Wilfried Wormsbacher, Kirchhain; Norbert Heimburger, Marburg; Peter Fuhge, Lahntal-Caldern, and Hans M. Preis, Marburg, all of Fed. Rep. of Germany, assignors to Behringwerke Aktiengesellschaft, Marburg, Fed. Rep. of Germany

Continuation of Ser. No. 40,756, Apr. 16, 1987, abandoned, which is a continuation of Ser. No. 691,369, Jan. 14, 1985, abandoned, which is a continuation of Ser. No. 523,883, Aug. 17, 1983, abandoned. This application Aug. 1, 1988, Ser. No. 227,481
Claims priority, application Fed. Rep. of Germany, Aug. 19, 1982, 3230849
Int. Cl.[5] A61K *37/02, 35/16;* C07K *15/06*
U.S. Cl. 514—21 11 Claims

1. A process for the pasteurization of human fibrinogen comprising the step of heating, at a temperature between 60° to 100° C. for 10 to 24 hours, an aqueous solution of human fibrinogen in the presence of (a) a thermally stabilizing amount of a carbohydrate selected from the group consisting of monosaccharide, oligosaccharide, sugar alcohol, and mixtures thereof, (b) an amino acid or mixture of amino acids, and (c) calcium ions in a concentration of 1 to 37,800 g atoms/mole of human fibrinogen.

4,960,758

NOVEL β-D-PHENYLTHIOXYLOSIDES, THEIR METHOD OF PREPARATION AND THEIR USE AS PHARMACEUTICALS

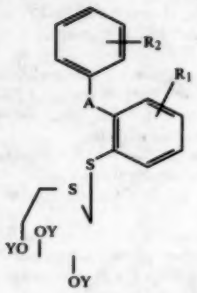
Soth Samreth, Longvic; Francois Bellamy, Saulon la Chapelle, and Jean Millet, Saulon la Rue, all of France, assignors to Fournier Innovation et Synergie, Paris, France

Continuation-in-part of Ser. No. 185,422, Apr. 25, 1988, Pat. No. 4,877,808. This application Nov. 3, 1988, Ser. No. 266,857
The portion of the term of this patent subsequent to Oct. 31, 2006, has been disclaimed.
Int. Cl.[5] C07D *335/02;* A61K *31/38*
U.S. Cl. 514—24 4 Claims

1. An oside compound selected from the group consisting of:

(i) the β-D-phenylthioxylosides of the formula:

(I)



in which:

R_1 and R_2, which are identical or different, each represent a hydrogen atom, a trifluoromethyl group or a cyano group,

A represents the CHOH group or the CO group and Y represents the hydrogen atom or an alkanoyl radical containing from 2 to 5 carbon atoms group; and

(ii) epimers thereof when A is CHOH.

4,960,759

PHARMACOLOGICAL USE OF URIDINE IN THE TREATMENT OF NERVOUS DISORDERS

Giovanna De Luca; Giovanni Di Stazio; Mario Materazzi, and Vincenzo Politi, all of Rome, Italy, assignors to Polifarma S.P.A., Rome, Italy

Filed Jun. 19, 1989, Ser. No. 367,615

Claims priority, application Italy, Jun. 21, 1988, 48118 A/88

Int. Cl.[5] A61K *31/70*

U.S. Cl. 514—50 **6 Claims**

1. A method for the treatment of Parkinson's disease comprising administering to a patient in need thereof, a therapeutically effective amount of uridine.

4,960,760

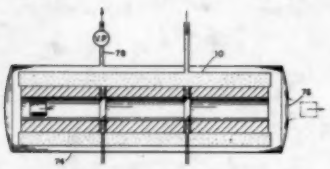
CONTACTLESS MASS TRANSFER SYSTEM

Xingwu Wang, and James D. Royston, both of Alfred, N.Y., assignors to Howard J. Greenwald, Rochester, N.Y.

Filed Aug. 10, 1989, Ser. No. 392,199

Int. Cl.[5] F41F *1/02*

U.S. Cl. 505—1 **20 Claims**



1. A contactless mass transfer system, comprised of a chamber formed by alternating sections of superconductive material and electromagnetic coils, means for cooling said chamber, and means for delivering asynchronous direct current pulses to said chamber, wherein:

(a) the interior surfaces of said chamber define a symmetrical shape;

(b) said chamber is comprised of at least two sections, each of which consists essentially of superconductive material which has a first critical field value greater than about 10 Gauss and a second critical field value of greater than about 30 Tesla, wherein:

1. said sections consisting essentially of superconductive material are separated from each othger by an air gap, wherein:

(a) each of the air gaps between two adjacent sections of superconductive material are less than 50 percent of the levitation height of the system, and

(b) said levitation height is the average distance between the top surface of said chamber and the center of said chamber;

(c) and electromagnetic coil is disposed within each said air gaps, wherein:

1. the length of the each of said sections of superconductive material is at least four times as great as the width of each of said coils,

2. said chamber is comprised of at least two of said electromagnetic coils disposed within said air gaps,

3. said means for delivering asynchronous direct current pulses provides direct current pulses to at least two of said coils in said chamber at different points in time.

4,960,761

HIGH SURFACE AREA POLYMERS OF PYRROLE OR COPOLYMERS OF PYRROLE

Richard Yodice, Willoughby, Ohio, assignor to The Lubrizol Corporation, Wickliffe, Ohio

Division of Ser. No. 65,159, Jun. 24, 1987, Pat. No. 4839,322.

This application Nov. 28, 1988, Ser No. 276,999

Int. Cl.[5] B01J *31/06*

U.S. Cl. 502—159 **12 Claims**

1. A process for preparing a pulverant catalytic composition comprising a polymer of pyrrole or a copolymer of pyrrole and mixtures thereof obtained by treating a pyrrole or a copolymerizable mixture of a pyrrole comprising the steps of:

(a) obtaining a pyrrole or a copolymerizable mixture containing a pyrrole;

(b) introducing to the pyrrole or copolymerizable mixture containing a pyrrole a peroxide;

(c) reacting the mixture of the pyrrole or copolymerizable mixture containing a pyrrole and the peroxide for a sufficient amount of time to polymerize the pyrrole or the copolymerizable mixture containing a pyrrole,

(d) treating the polymer of pyrrole or copolymer of pyrrole in the presence of a strong base to substantially increase the surface area of the polymer of pyrrole or copolymer of pyrrole, and

(e) introducing to the high surface area polymer of pyrrole or copolymer of pyrrole material, thereby forming the catalytic composition.

4,960,762

CHIRAL TWO-PHASE SYSTEM AND METHOD FOR RESOLUTION OF RACEMIC MIXTURES AND SEPARATION OF DIASTEREOMERS

Börje Sellergren; Björn A. Ekberg; Per-Ake Albertsson, and Klaus Mosbach, all of Avd. for Tillampad Biokemi, Kemicentrum, Box 124, S-221 00 Lund, Sweden

PCT No. PCT/SE86/00315, § 371 Date Mar. 11, 1987, § 102(e) Date Mar. 11, 1987, PCT Pub. No. WO87/00165, PCT Pub. Date Jan. 15, 1987

PCT Filed Jun. 27, 1986, Ser. No. 30,855

Claims priority, application Sweden, Jun. 28, 1985, 8503220

Int. Cl.[5] C07B *57/00*

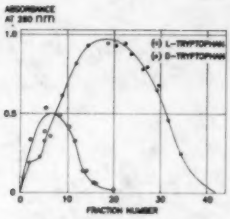
U.S. Cl. 514—57 **14 Claims**

1. A method for chiral resolution of racemic mixtures, or for separation of diastereomers, wherein the different enantiomers or diastereomers are partitioned differently between the phases of a chiral two-phase system comprising two immiscible liquid phases and one or more enantioselectively binding chiral components, each of which is substantially in one of said phases, by selectively binding one of said enantiomers or diastereomers to one of the chiral components.

14. A method for chiral resolution of a mixture of a D-tryptophan enantiomer and a L-tryptophan enantiomer, wherein

the enantiomers are partitioned differently between phases of a chiral two-phase system comprising:

(a) two immiscible liquid phases, including a dextran liquid phase and a polyethylene glycol liquid phase; and



(b) bovine serum albumin, wherein the albumin is substantially in one of the liquid phases;

by selectively binding the L-tryptophan enantiomer to the bovine serum albumin.

4,960,763

METHOD OF USING BACTERIAL CELLULOSE AS A DIETARY FIBER COMPONENT

R. Scott Stephens, Auburn; John A. Westland, Bothell, and Amar N. Neogi, Seattle, all of Wash., assignors to Weyerhaeuser Company, Tacoma, Wash.

Filed Apr. 18, 1988, Ser. No. 182,670

Int. Cl.[5] A61K *31/715, 47/38*

U.S. Cl. 514—57 **30 Claims**

1. A method of binding a portion of the cholesterol present in an aqueous suspension which comprises adding a sufficient amount of a purified bacterial cellulose to the suspension.

4,960,764

OIL-IN-WATER-IN-SILICONE EMULSION COMPOSITIONS

Ramon Figueroa, Jr., Oxford; Bobby G. Harrison, Jr., East Norwalk, and James P. SaNogueira, Newtown, all of Conn., assignors to Richardson-Vicks Inc., Shelton, Conn.

Continuation of Ser. No. 22,876, Mar. 6, 1987, abandoned. This application Feb. 15, 1989, Ser. No. 312,347

Int. Cl.[5] A61K *31/695*

U.S. Cl. 514—63 **6 Claims**

1. An oil-in-water-in-silicon fluid emulsion composition comprising (a) from about 15% to about 70% weight of a silicone fluid continuous phase consisting essentially of at least one liquid organopolysiloxane; (b) from about 30% to about 80% by weight of an aqueous discontinuous phase comprising an oil-in-water emulsion of a cosmetically acceptable oily liquid non-particulate phase dispersed in an aqueous phase; and (c) from about 0.5% to about 5% by weight of an effective dispersing amount of dimethicone copolyol for dispersing (b) in (a).

4,960,765

PHARMACEUTICAL COMPOSITION AND METHOD FOR THE TREATMENT OF COLITIS ULCEROSA AND CROHN'S DISEASE BY ORAL ADMINISTRATION

Soren Halskov, Helsinge, Denmark, assignor to Farmaceutisk Laboratorium Ferring A/S, Vanlose, Denmark

Division of Ser. No. 59,196, Jun. 8, 1987, Pat. No. 4,880,704, which is a continuation of Ser. No. 689,852, Jan. 8, 1985, abandoned, which is a division of Ser. No. 555,533, Nov. 28, 1983, Pat. No. 4,496,553, which is a continuation of Ser. No. 270,517, May 29, 1981, abandoned. This application Jun. 26, 1989, Ser. No. 371,069

Int. Cl.[5] A61K *31/60*

U.S. Cl. 514—166 **12 Claims**

1. A method for the treatment of ulcerative colitis or Crohn's disease comprising orally administering an effective amount of a composition consisting essentially an ester of free 5-aminosalicylic acid in admixture with a parmaceutically acceptable carrier so as to delay the release of said effective amount of said ester of 5-aminosalicylic acid to be aministered essentially until the colon of the patient is reached.

4,960,766

CEPHEM COMPOUNDS

Takao Takaya; Kazuo Sakane; Kenzi Miyai, all of Kawanishi, and Kohji Kawabata, Osaka, all of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

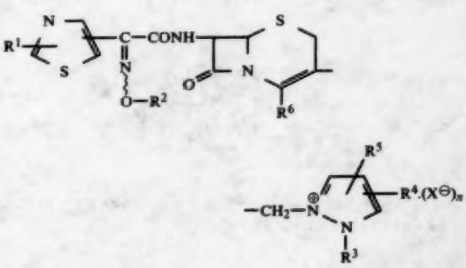
Filed Nov. 14, 1986, Ser. No. 930,427

Claims priority, application United Kingdom, Nov. 22, 1985, 8528803; May 1, 1986, 8610720

Int. Cl.[5] C07D *501/36;* A61K *31/545*

U.S. Cl. 514—202 **12 Claims**

1. A new cephem compound of the formula:



wherein

R^1 is amino or protected amino,

R^2 is lower alkyl, dihalogenated lower alkyl, carboxy(lower-)alkyl or protected carboxy(lower)alkyl,

R^3 is lower alkyl,

R^4 and R^5 are each hydrogen, lower alkyl, hydroxy(lower-)alkyl, lower alkoxy, amino or protected amino,

R^6 is $COO^{\ominus}$, carboxy or protected carboxy,

$X^{\ominus}$ is an anion, and

n is 0 or 1,

with proviso that

(i) when R^2 is carboxy(lower)alkyl or protected carboxy(-lower)alkyl, then R^4 is hydrogen and R^5 is amino,

(ii) when R^6 is $COO^{\ominus}$, then n is 0, and

(iii) when R^6 is carboxy or protected carboxy, then n is 1,

and a pharmaceutically acceptable salt thereof.

4,960,767

ISOXAZOLOBENZOXAZEPINES

Gregory M. Shutske, Somerset, and Kevin J. Kapples, Little York, both of N.J., assignors to Hoechst-Roussel Pharmaceuticals Inc., Somerville, N.J.

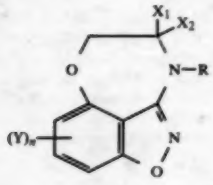
Continuation-in-part of Ser. No. 226,930, Aug. 1, 1988, Pat. No. 4,873,234. This application Jan. 30, 1989, Ser. No. 302,027

The portion of the term of this patent subsequent to Oct. 10, 2006, has been disclaimed.

Int. Cl.[5] **C07D** *488/04;* **A61K** *31/55*

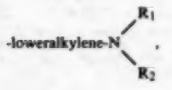
U.S. Cl. 514—211 **9 Claims**

1. As isoxazolobenzoxazepine of the formula

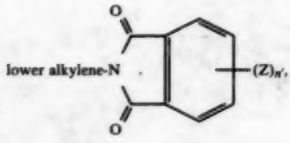


wherein X_1 is H; X_2 is H or OH; or X_1 and X_2 taken together are carbonyl oxygen or

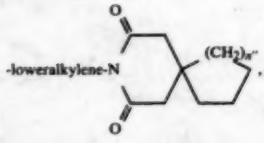
R is (1) H, (2) loweralkyl, (3) arylloweralkyl, (4) loweralkynyl, (5) loweralkenyl, (6)



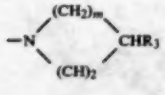
where R_1 and R_2 are independently (a) H, (b) lower alkyl, (c) arylloweralkyl, (d)



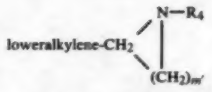
where Z is H, halogen, loweralkyl, loweralkoxy, CF_3, nitro or amino and n' is a integer of 1 to 3; (e)



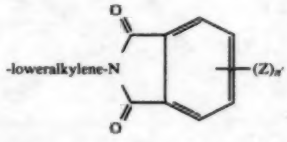
where n'' is an integer of 1 to 3; or (f) R_1 and R_2 taken together with the nitrogen atom are substituted or unsubstituted piperidino or pyrrolidino of the formula



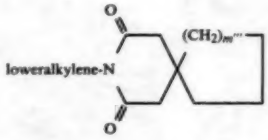
where R_3 is H, loweralkyl or aryl, and m is an integer of 1 or 2; (7)



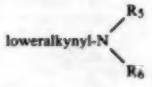
where R_4 is H or loweralkyl and m' is an integer of 3 or 4; (8)



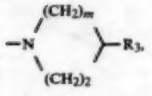
where Z and n' are as previously defined; (9)



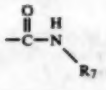
where m''' is an integer of 1,2 or 3; (10)



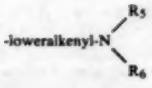
where R_5 and R_6 are independently alkyl, aryl lower alkyl or are taken together with the N atom to form a substituted or unsubstituted piperidino or pyrrolidino group of the formula



where R_3 and m are as defined above; (11)



where R_7 is loweralkyl, aryl or aryl lower alkyl; (12)



where R_5 and R_6 are as previously defined; Y is H, halogen, loweralkyl, loweralkoxy, CF_3, nitro or amino and n is an integer of 1 to 3, and the pharmaceutically acceptable acid addition salts thereof and where applicable to the geometric, and stereo isomers thereof.

4,960,768

ACYLOXYTHIOPHENE-CARBOXAMIDE FUNGICIDES

Werner Daum, Krefeld, and Gerd Hänssler, Leverkusen, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

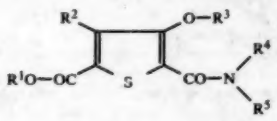
Division of Ser. No. 194,742, May 17, 1988, Pat. No. 4,863,954, which is a division of Ser. No. 27,755, Mar. 19, 1987, Pat. No. 4,767,757. This application May 8, 1989, Ser. No. 348,931

Claims priority, application Fed. Rep. of Germany, Mar. 29, 1986, 3610711

Int. Cl.[5] A01N *43/40, 43/84;* C07D *401/06, 333/32*

U.S. Cl. 514—212 15 Claims

1. An acyloxythiophene-carboxamide of the formula



in which

R^1 represents alkyl, alkoxyalkyl, alkylthioalkyl, fluoroalkyl, cyanoalkyl, alkenyl, alkinyl or cycloalkyl,

R^2 represents alkyl or optionally substituted phenyl, the optional substituents being independently selected from the group consisting of alkyl having 1 to 4 carbon atoms, alkoxy or alkylthio each having 1 to 4 carbon atoms, halogen, nitro, halogenoalkyl, halogenoalkoxy or halogenoalkylthio each having 1 to 4 carbon atoms and 1 to 5 identical or different halogen atoms,

R^3 represents the —OC—Q radical, in which

Q represents alkyl which is optionally identically or differently substituted by halogen, alkoxy, alkylthio, alkylsulphonyl, alkylthioalkoxy, alkoxycarbonyl, phenyl, phenoxy or halogenophenoxy; alkenyl which is optionally identically or differently substituted by halogen, phenyl, halogenophenyl or halogenoalkylphenyl; alkinyl; cycloalkyl; alkoxy which is optionally substituted by halogen or cyano; phenyl which is optionally identically or differently substituted by halogen, alkyl, halogenoalkyl, alkoxy, halogenoalkoxy, alkylthio, halogenoalkylthio, alkylsulphinyl, halogenoalkylsulphinyl, alkylsulphonyl or halogenoalkylsulphonyl and

R^4 and R^5, together with the adjacent nitrogen atom represent pyrrolidine, piperidine, 2-methylpiperidine, 3-methylpiperidine, 4-methylpiperidine, hexahydro-1H-azepine, morpholine, 2,6-dimethylmorpholine, thiazolidine, N^1-methylpiperazine or N^1-propylpiperazine.

5. A fungicidal composition comprising a fungicidally effective amount of a compound according to claim 1 and a diluent.

4,960,769

5,6,7,8-TETRAHYDRO-4H-ISOXAZOLO[4,5-C]-AZEPINE DERIVATIVES

Povl Krogsgaard-Larsen, Alleroed; Erik Falch, Vedbaek, and Henrik Pedersen, Broenshoej, all of Denmark, assignors to H. Lundbeck A/S, Copenhagen-Valby, Denmark

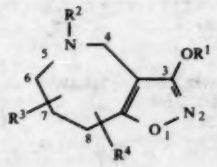
Filed Nov. 21, 1988, Ser. No. 274,271

Claims priority, application United Kingdom, Nov. 23, 1987, 8727385

Int. Cl.[5] C07D *223/00;* A61K *31/55*

U.S. Cl. 514—215 8 Claims

1. A compound of the following formula:



I

wherein R^1 is alkyl, alkenyl, alkynyl, branched or unbranched, with 1–6 carbon atoms either unsubstituted or optionally substituted with fluoro, hydroxy or phenyl, in which the phenyl group may be substituted with halogen, trifluoromethyl, lower alkyl, hydroxy alkoxy;

R^2 is hydrogen or lower alkyl (1–6 C-atoms);

R^3 and R^4 are the same or different, and each represents hydrogen, alkyl (1–6 C-atoms) or cycloalkyl (3–6 C-atoms), or phenyl optionally substituted with halogen, trifluoromethyl, lower alkyl (1–6 C-atoms), hydroxy, or lower alkoxy (1–6 C-atoms) or phenyl-lower alkyl (7–10 C-atoms), in which the phenyl group may be substituted with halogen, trifluoromethyl, lower alkyl (1–6 C-atoms), hydroxy or lower alkoxy (1–6 C-atoms);

as well as individual isomers and pharmaceutically-acceptable acid addition salts thereof.

7. Method for the treatment of disorders caused by malfunction of the acetylcholine (AcCh) or muscarinic system comprising the step of administering orally or parenterally to a subject in need of such treatment an effective amount of compound of claim 1.

4,960,770

2-ALKYL THIENO(TRIAZOLO)DIAZEPINE COMPOUNDS AND PHARMACEUTICAL USES THEREOF

Minoru Moriwaki, Nakatsu; Masao Abe, Buzen; Hiroshi Mikashima, Fukuoka, and Tetsuya Tahara, Nakatsu, all of Japan, assignors to Yoshitomi Pharmaceutical Industries, Ltd., Osaka, Japan

PCT No. PCT/JP88/00506, § 371 Date Jan. 11, 1989, § 102(e) Date Jan. 11, 1989, PCT Pub. No. WO88/09333, PCT Pub. Date Dec. 1, 1988

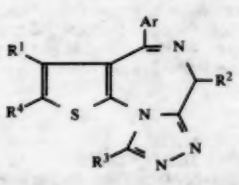
PCT Filed May 25, 1988, Ser. No. 304,989

Claims priority, application Japan, May 28, 1987, 62-132058; May 29, 1987, 62-137195; Jun. 16, 1987, 62-149698

Int. Cl.[5] A61K *31/55;* C07D *243/24*

U.S. Cl. 514—219 5 Claims

1. A thienotriazolodiazepine compound of the formula:



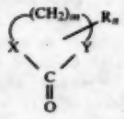
wherein Ar is phenyl, pyridyl, substituted phenyl or substituted pyridyl; R^1 and R^3 are the same or different and each is hydrogen, alkyl having 1 to 4 carbon atoms; R^2 is hydrogen, alkyl having 1 to 4 carbon atoms or trifluoromethyl; R^4 is straight or branched chain alkyl, alkenyl or alkynyl having 6 to 18 carbon atoms, or a pharmaceutically acceptable acid addition salt thereof.

4,960,771
OXAZOLIDINONE PENETRATION ENHANCING COMPOUNDS

Vithal J. Rajadhyaksha, 27436 Esquina, Mission Viejo, Calif. 92691

Filed Jul. 12, 1988, Ser. No. 218,316
Int. Cl.[5] A61K *31/42, 31/535*
U.S. Cl. 514—228.8 **8 Claims**

1. A composition useful for treating of humans or other animals by the application to the skin or other membrane of such animal, such composition comprising of one or more physiologically active compounds in intimate mixture with an effective amount of one or more penetration enhancers having the formula:



where:

R=H, Alkyl group containing from 1–18 carbon atoms, cycloalkyl, aryl, aralkyl, alkoxy, hydroxyalkyl, alkoyloxyalkyl, acyloxyalkyl and alkoxyalkyl;

X=O and NR_1, where R_1 is selected from H, alkyl, aralkyl, acyl group containing from 1–18 carbon atoms, cyloalkyl, hydroxyalkyl, alkoyloxyalkyl, acyloxyalkyl and alkoxyalkyl;

Y=O and NR_2, where R_2 is selected from H, alkyl, aralkyl, cycloalkyl, acyl group containing from 1–18 carbon atoms, hydroxyalkyl, alkoyloxyalkyl, acyloxyalkyl and alkoxyalkyl;

m=2–4; and

n=0–4.

with the provisos that:

(i) at least one of X and Y is O;

(ii) when R=H, X=O and Y=NR_2, then R_2 is not alkyl; and

(iii) when X and Y are O, then R is not lower alkyl, i.e., if alkyl, R is C5–C18.

4,960,772
BENZOYL PEROXIDE AND QUATERNARY AMMONIUM BASED PHARMACEUTICAL AND COSMETIC COMPOSITIONS

Henri Sebag, Paris, and Irina Beck, Villepinte, both of France, assignors to L'Oreal, Paris, France

Filed Feb. 23, 1989, Ser. No. 314,659
Claims priority, application France, Mar. 9, 1988, 88 03042
Int. Cl.[5] A61K *31/14*
U.S. Cl. 514—231.2 **18 Claims**

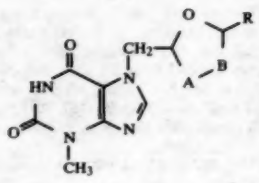
1. A composition for topical application consisting essentially of benzoyl peroxide and a quaternary ammonium salt selected from the group consisting of a quaternary ammonium alkyl sulfate, alkyl sulfonate, benzene sulfonate and alkylbenzene sulfonate as active ingredients in a physiologically acceptable medium.

4,960,773
XANTHINE DERIVATIVES

Dezső Korbonits; Gergely Héja; Maria Szomor, all of Budapest, and Emil Minker, Szeged, all of Hungary, assignors to Chinoin Gyogyszer- es Vegyeszeti Termekek Gyara RT., Budapest, Hungary

Filed Nov. 2, 1988, Ser. No. 266,438
Claims priority, application Hungary, Nov. 2, 1987, 4905/87
Int. Cl.[5] C07D *473/06*
U.S. Cl. 514—234.21 **8 Claims**

1. A compound of the Formula (I)



(I)

or a physiologically acceptable salt thereof

wherein

A and B are each either oxygen or —CH_2—;

R is either hydrogen or —CH_2—Q; and

Q is hydrogen, pyrrolidino, piperidino, or morpholino; with the proviso that if A is oxygen, then B is —CH_2— and

R is hydrogen, and with the further proviso that if A is —CH_2—, B is oxygen, and R is —CH_2—Q where Q is hydrogen, pyrrolidino, piperidino or morpholino.

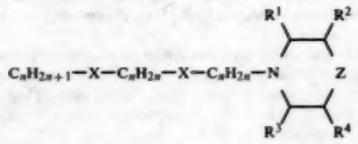
8. An antitussive pharmaceutical composition comprising as active ingredient a therapeutically effective amount of the compound of the formula I or a physiologically acceptable salt thereof, as defined in claim 1, in combination with a pharmaceutically acceptable inert carrier.

4,960,774
CYCLIC AMINES AND FUNGICIDES CONTAINING THEM

Costin Rentzea, Heidelberg; Eberhard Ammermann, Ludwigshafen, and Gisela Lorenz, Neustadt, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Jun. 8, 1989, Ser. No. 363,087
Claims priority, application Fed. Rep. of Germany, Jun. 8, 1988, 3819465
Int. Cl.[5] C07D *211/14, 295/084;* **A01N** *43/40, 43/84*
U.S. Cl. 514—239.2 **5 Claims**

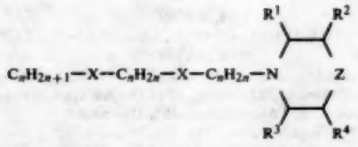
1. An amine of the general formula I



I

where n is an integer from 2 to 10, the individual values of n being identical or different, X is oxygen or sulfur, Z is oxygen or CH—R_5, and R^1, R^2, R^3, R^4 and R^5 are identical or different and are each hydrogen or C_{1-2} alkyl, or a salt thereof.

3. A process for combating fungi, wherein the fungi, or the plants, soil or seed to be protected against fungus attack are treated with a fungicidally effective amount of an amine of the formula



I

where n is an integer from 2 to 10, the individual values of n being identical or different, X is oxygen or sulfur, Z is oxygen or CH—R_5, and R^1, R^2, R^4 and R^5 are identical or different and are each hydrogen or C_{1-2} alkyl, or a salt thereof.

4,960,775

PYRROLOPHTHALAZINES

Michael J. Ashton; Andrew W. Bridge, both of Chelmsford; Donald I. Dron, Upminster; Garry Fenton, Brentwood; David J. Lythgoe, Gidea Park; Christopher G. Newton, Chelmsford; David Riddell, Billericay; Christopher Smith, Benfleet, and Keith A. J. Stuttle, Rockford, all of England, assignors to May & Baker Limited, Dagenham, England

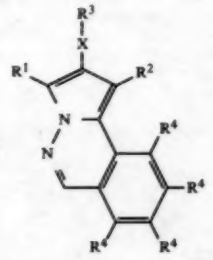
Filed Dec. 2, 1988, Ser. No. 279,123

Claims priority, application United Kingdom, Dec. 3, 1987, 872314

Int. Cl.[5] A61K *31/50;* **C07D** *487/04*

U.S. Cl. 514—248 **16 Claims**

1. A pyrrolo[2,1-a]phthalazine of the formula:

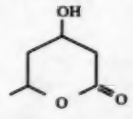


I

wherein R^1 and R^2, which may be the same or different, each represents a cycloalkyl group of 3 to 8 carbon atoms, or represents a straight- or branched-chain alkyl, alkenyl or alkynyl group of up to 6 carbon atoms which may be substituted by up to three halogen atoms or represents a phenyl group which is unsubstituted or substituted by one or more substituents selected from the group consisting of halogen atoms, cycloalkyl and cycloalkenyl groups each of 4 to 8 carbon atoms, and straight- or branched-chain alkyl, alkenyl or alkynyl groups each of up to 6 carbon atoms which are themselves unsubstituted or substituted by up to three substituents selected from the group consisting of halogen atoms and straight- or branched-chain alkoxy and alkylthio groups each of up to 6 carbon atoms, X represents an ethylene or vinylene group, R^3 represents a group of the formula:

$$—Y—CH_2—CH(OH)—CH_2—COOR^5 \quad \text{(II)}$$

wherein Y represents a carbonyl or hydroxymethylene group and R^5 represents a hydrogen atom or an alkyl group of up to 6 carbon atoms which is unsubstituted or substituted by up to three substituents selected from the group consisting of halogen atoms and straight- or branched-chain alkoxy and alkylthio groups each of up to 6 carbon atoms, or R^3 represents a lactone ring of the formula:



III

and the symbols R^4 may be the same or different and each represents a hydrogen or halogen atom or represents a straight- or branched-chain alkyl, alkanyl or alkynyl group of up to 6 carbon atoms which is unsubstituted or substituted by up to three substituents selected from the group consisting of halogen atoms and straight- or branched-chain alkoxy and alkylthio groups each of up to 6 carbon atoms, or a phenyl group which is unsubstituted or substituted by one or more substituents selected from the group consisting of halogen atoms, cycloalkyl and cycloalkenyl groups each of 4 to 8 carbon atoms, and straight- or branched-chain alkyl, alkenyl or alkynyl groups each of up to 6 carbon atoms which are themselves unsubstituted or substituted by up to three substituents selected from the group consisting of halogen atoms and straight- or branched-chain alkoxy and alkylthio groups each of up to 6 carbon atoms, or a group of the formula $R^6O—$ wherein R^6 represents a straight- or branched-chain alkyl group of up to 6 carbon atoms, a phenyl group or a phenylalkyl group of 1 or 2 carbon atoms in the alkyl moiety, or a pharmaceutically acceptable salt thereof when R^5 represents a hydrogen atom.

4,960,776

4-ARYL-N-(ALKYLAMINOALKYL, HETEROCYCLICAMINO AND HETEROCYCLICAMINO)ALKYL)-1-PIPERAZINECARBOXAMIDES

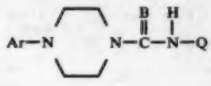
David A. Walsh, Richmond, and Albert D. Cale, Jr., Mechanicsville, both of Va., assignors to A. H. Robins Company, Inc., Richmond, Va.

Filed Jan. 28, 1987, Ser. No. 7,592

Int. Cl.[5] A61K *31/495, 31/445;* **C07D** *401/12, 403/12*

U.S. Cl. 514—252 **73 Claims**

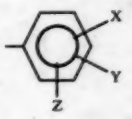
1. A compound selected from the group having the formula:



wherein;

B is oxygen or sulfur;

Ar is selected from



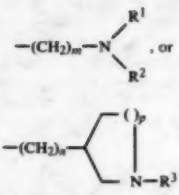
or 2, 3 or 4-pyridyl;

X is selected from hydrogen,
halogen,
loweralkyl,
loweralkoxy,
amino,
dimethylamino,
nitro,
trifluoromethyl,
cyano,
acetyl,
acetylamino,
aminocarbonyl,
carboxy, or loweralkyl carboxylic acid ester;

Y is selected from hydrogen,
halogen,
loweralkyl,
loweralkoxy,
nitro,
trifluoromethyl,
cyano,
acetyl,
acetylamino,
aminocarbonyl,
carboxy, or loweralkyl carboxylic acid ester;

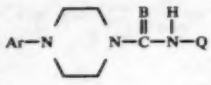
Z is selected from
hydrogen,
loweralkyl, or
loweralkoxy;

Q is selected from

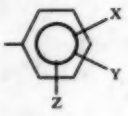


m is 1 to 3 inclusive;
n is zero or 1;
p is zero to 3 inclusive;
R^1, R^2 and R^3 are loweralkyl and may be the same or different, or R^1 and R^2 taken together with the adjacent nitrogen atom may form a heterocyclic residue, and the pharmaceutically acceptable salts thereof.

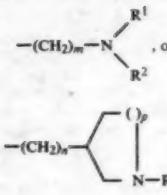
37. A method of inhibiting Type I allergic response in a living animal body which comprises administering to said animal in need thereof a compound selected from the group having the formula:



wherein;
B is oxygen or sulfur;
Ar is selected from

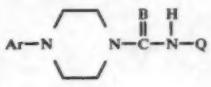


or 2, 3 or 4-pyridyl;
X is selected from hydrogen,
halogen,
loweralkyl,
loweralkoxy,
amino,
dimethylamino,
nitro,
trifluoromethyl,
cyano,
acetyl,
acetylamino,
aminocarbonyl,
carboxy, or
loweralkyl carboxylic acid ester;
Y is selected from hydrogen,
halogen,
loweralkyl,
loweralkoxy,
nitro,
trifluoromethyl,
cyano,
acetyl,
acetylamino,
aminocarbonyl,
carboxy, or
loweralkyl carboxylic acid ester;
Z is selected from
hydrogen,
loweralkyl, or
loweralkoxy;
Q is selected from

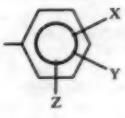


m is 1 to 3 inclusive;
n is zero or 1;
p is zero to 3 inclusive;
R^1, R^2 and R^3 are loweralkyl and may be the same or different, or R^1 and R^2 taken together with the adjacent nitrogen atom may form a heterocyclic residue, and the pharmaceutically acceptable salts thereof.

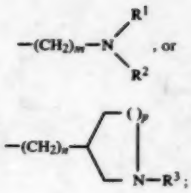
73. A pharmaceutical composition for combating allergy in unit dosage form comprising (a) an effective amount of a compound selected from those having the formula:



wherein;
B is oxygen or sulfur;
Ar is selected from phenyl,



or 2, 3 or 4-pyridyl;
X is selected from hydrogen,
halogen,
loweralkyl,
loweralkoxy,
amino,
dimethylamino,
nitro,
trifluoromethyl,
cyano,
acetyl,
acetylamino,
aminocarbonyl,
carboxy, or
loweralkyl carboxylic acid ester;
Y is selected from
hydrogen,
halogen,
loweralkyl,
loweralkoxy,
nitro,
trifluoromethyl,
cyano,
acetyl,
acetylamino,
aminocarbonyl,
carboxy, or
loweralkyl carboxylic acid ester;
Z is selected from
hydrogen,
loweralkyl, or
loweralkoxy;
Q is selected from



m is 1 to 3 inclusive;
n is zero or 1;
is zero to 3 inclusive;
R^1, R^2 and R^3 are loweralkyl and may be the same or different, or R^1 and R^2 taken together with the adjacent nitrogen atom may form a heterocyclic residue, and the pharmaceutically acceptable salts thereof.
and, (b) a suitable pharmaceutical carrier therefor.

4,960,777

HETEROARYLOXY-β-CARBOLINE DERIVATIVES, THEIR PREPARATION AND THEIR USE AS MEDICINAL AGENTS

Helmut Biere; Andreas Huth; Dieter Rahtz; Ralph Schmiechen; Dieter Seidelmann; David Stephens, all of Berlin, Fed. Rep. of Germany; Mogens Engelstoft, Vaerlose, and John B. Hansen, Lyngby, both of Denmark, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany

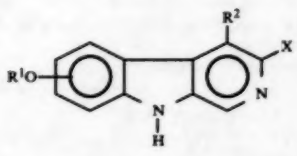
Division of Ser. No. 23,752, Mar. 9, 1987, Pat. No. 4,877,792. This application Sep. 20, 1989, Ser. No. 409,899

Claims priority, application Fed. Rep. of Germany, Mar. 8, 1986, 3608089

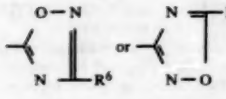
Int. Cl.[5] **A61K** *31/38, 31/40, 31/435;* **C07D** *413/12*

U.S. Cl. 514—253 **17 Claims**

1. A heteroaryloxy-β-carboline of the formula



wherein
R^1 is pyrimidine, pyrazine of pyridazine or such a group substituted by halo, nitro, amino, cyano, C_{1-6}-alkyl, or (C_{1-6}-alkoxy)carbonyl,
R^2 is hydrogen, C_{1-6} -alkyl or C_{1-6} alkoxy-C_{1-6}-alkyl, is $COOR^3$, $CONR^4R^5$, or oxadiazoyl of the formula



$R^3$is H or C_{1-6}-alkyl,
R^4 and R^5 independently are each H or C_{1-6}-alkyl, or R^4 and R^5 together form with the connecting nitrogen atom, an aliphatic, saturated 5- or 6-membered heterocycle, or a 5-or 6-membered heterocycle containing an O, S or second N atom, and
R^6 is hydrogen, C_{1-6}-alkyl or C_{3-7} -cycloalkyl.

15. A method of achieving an anxiolytic effect comprising administering a compound of claim 1.

4,960,778

NEW BENZOXAZOLINONE COMPOUNDS

Daniel Lesieur, Gondecourt; Nourddine Abdellatifi, Wattignies; Hocine Aichaoui, Loos, and Jacqueline Bonnet, Paris, all of France, assignors to ADIR Et Cie, Neuilly-sur-Seine, France

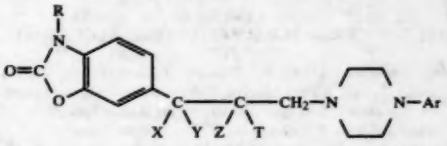
Filed Oct. 3, 1989, Ser. No. 416,595

Claims priority, application France, Oct. 4, 1988, 88 12945

Int. Cl.[5] **A61K** *31/495;* **C07D** *413/06, 413/12*

U.S. Cl. 514—253 **12 Claims**

1. A compound selected from those of the formula (I):



(I)

in which:
X denotes a hydrogen atom,
Y denotes a hydrogen atom or a hydroxyl group or alternatively X and Y together denote an oxygen atom,
T denotes a hydrogen atom or a lower alkyl group,
Z denotes a hydrogen atom or alternatively Z forms a π bond with Y, in which case X denotes a hydrogen atom,
R denotes a hydrogen atom or a lower alkyl group,
Ar denotes an phenyl or heteroaryl, having 4–8 C and 1 or 2 N, O, or S atoms, or (lower alkyl)aryl group, which groups may be substituted with a halogen atom or a lower alkyloxy or alkyl group, which itself may be substituted with one or more halogen atoms,
an enantiomer, epimer or diastereoisomer thereof as well as an addition salt of any of the foregoing with a pharmaceutically acceptable acid.

12. A method for treating a living animal body afflicted with pain comprising the step of administering to the said living animal an amount of a compound of claim 1 which is effective for the alleviation of the said condition.

4,960,779

PYRROLE DERIVATIVES, AND PHARMACEUTICAL COMPOSITIONS WHICH CONTAIN THEM AND PHARMACOLOGICAL METHODS OF USE

Jean-Dominique Bourza, Paris; Marc Capet, Thiais; Claude Cotrel, Paris, all of France; Richard Labaudiniere, Bruehl, Fed. Rep. of Germany; Philippe Pitchen, Brentwood, England, and Gerard Roussel, Soisy S/Seine, France, assignors to Rhone-Poulenc Sante, Antony, France

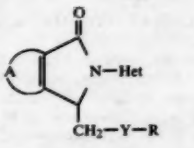
Continuation-in-part of Ser. No. 126,520, Nov. 30, 1987, abandoned. This application Jun. 1, 1989, Ser. No. 360,122

Claims priority, application France, Dec. 2, 1986, 86 16795

Int. Cl.[5] **C07D** *470/104;* **A61K** *31/435*

U.S. Cl. 514—300 **12 Claims**

1. A pyrrole derivative of the formula:



(I)

in which A forms with the pyrrole ring a 1-isoindoline ring system, Het denotes a 1, 8-naphthyridine ring system, which is unsubstituted or substituted with a halogen or a (1 to 4 C.) alkyl, (1 to 4 C.) alkyloxy, or (1 to 4 C.) alkylthio radical, Y denotes a CO, C=NOH or CHOH radical and R denotes a straight-or branched-chain alkenyl radical containing 3 to 10 carbon atoms or a straight or branched unsubstituted alkyl

radical of 4 to 10 carbon atoms, or an alkyl radical which is substituted by alkyloxy, cyclohexyl or dialkylamino, or phenyl, or R denotes benzyl and, where they exist, "or a pharmaceutically acceptable salt thereof or an optical isomer thereof."

11. Method of producing an anxiolytic, hypnotic, anticonvulsant, antiepileptic or muscle relaxant therapeutic effect in a subject in which such therapy is desirable which comprises administering to said subject an effective amount of a pyrrole derivative according to claim **1**.

4,960,780

HYDROIMIDAZO [1,2-A] PYRIDINES INSECTICIDAL NITRO

Kozo Shiokawa, Kanagawa; Shinichi Tsuboi, Tokyo; Shoko Sasaki, Tokyo; Koichi Moriya, Tokyo; Yumi Hattori, Tokyo, and Katsuhiko Shibuya, Tokyo, all of Japan, assignors to Nihon Tokushu Noyaku Seizo K. K., Tokyo, Japan

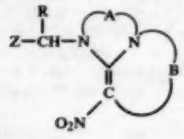
Division of Ser. No. 208,421, Jun. 17, 1988, Pat. No. 4,876,263. This application May 17, 1989, Ser. No. 353,370

Claims priority, application Japan, Jun. 26, 1987, 62-157528

Int. Cl.[5] **C07D** *31/435, 471/04*

U.S. Cl. 514—300 **7 Claims**

1. A nitro-substituted heterocyclic compound of the formula (I)



(I)

wherein R is hydrogen or alkyl,

Z is C_6–C_{10} aryl, or a 5 to 6-membered heterocyclic group containing 1 to 2 hetero atoms selected from the group consisting of O, S and N, at least one of which is a nitrogen atom, and said aryl and heterocyclic group is unsubstituted or substituted respectively by a member selected from the group consisting of halogen, C_1–C_4-alkyl, C_1–C_4-alkoxy, C_1–C_4-haloalkyl, C_1–C_4-alkylthio, C_1–C_4-haloalkoxy, C_1–C_4-haloalkylthio, nitro and cyano,

A is unsubstituted ethylene or ethylene substituted by methyl, and

B stands for 3 carbon atoms of a heterocyclic ring which is formed, together with the adjacent C-atom and N-atom and is unsubstituted or substituted by at least one substitutent selected from the group consisting of halogen, C_1–C_6-alkyl, C_1–C_4-alkoxy, alkoxycarbonyl having 1 to 4 carbon atoms in the alkoxy part, unsubstituted or substituted C_6–C_{10}-aryl, keto, imino, phenoxy, C_1–C_4-alkoxy, alkoxycarbonylimino having 1 to 4 carbon atoms in the alkoxy part, phenoxycarbonylimino, benzoylimino, benzyl, cyano, thioketo, hydroxy and C_1–C_2-alkylidene.

4,960,781

FUNGICIDAL DISAZOLYL-HYDROXYALKYL DERIVATIVES

Graham Holmwood, Wuppertal; Wolfgang Krämer, Burscheid; Erik Regel; Hans L. Elbe, both of Wuppertal; Karl H. Büchel, Burscheid; Stefan Dutzmann, Duesseldorf; Wilhelm Brandes, Leichlingen, and Paul Reinecke, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

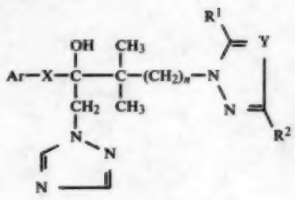
Continuation of Ser. No. 244,232, Sep. 14, 1988, abandoned. This application Feb. 16, 1990, Ser. No. 481,780

Claims priority, application Fed. Rep. of Germany, Sep. 15, 1987, 3730871

Int. Cl.[5] **A01N** *43/653;* **C07D** *249/08*

U.S. Cl. 514—383 **9 Claims**

1. A bisazolyl-hydroxyalkyl derivative of the formula



(I)

in which

Ar stands for phenyl which is optionally monosubstituted or disubstituted by identical or different substituents selected from the group consisting of fluorine, chlorine, methyl, trifluoromethyl, trifluoromethoxy and phenyl, or

Ar stands for naphthyl,

X represents the groupings $-CH_2-CH_2-$, $-OCH_2-$, $-SCH_2-$ or $-CH=CH-$, where the heteroatom is bonded to the phenyl radical if X stands for $-OCH_2-$ or $-SCH_2-$,

Y stands for a nitrogen atom or the grouping CR^3,

R^1 and R^2 stand for hydrogen or methyl,

R^3 stands for hydrogen, and

n stands for the numbers 0 or 1, or a hydrochloric acid or saccharin addition salt or metal salt complex thereof.

4,960,782

TRIAZOLE ANTIFUNGAL AGENTS

Geoffrey E. Gymer, Sandwich, and Kenneth Richardson, Birchington, both of England, assignors to Pfizer Inc., New York, N.Y.

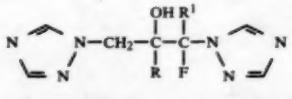
Continuation of Ser. No. 99,927, Sep. 23, 1987, abandoned, which is a continuation-in-part of Ser. No. 797,200, Nov. 14, 1985, abandoned, which is a continuation of Ser. No. 576,517, Feb. 2, 1984, abandoned. This application Oct. 23, 1989, Ser. No. 425,890

Claims priority, application United Kingdom, Feb. 25, 1983, 8305377

Int. Cl.[5] **A61K** *31/41;* **A01N** *43/653;* **C07D** *249/08*

U.S. Cl. 514—383 **5 Claims**

1. A triazole of the formula



(I)

where R is 2,4-difluorophenyl; R^1 is H, CH_3 or F; and a pharmaceutically and agriculturally acceptable salt thereof.

4,960,783

USE OF BENZIMIDAZOLE DERIVATIVES AS YIELD PROMOTERS

Gerhard Bonse, Cologne; Werner Hallenbach, Langenfeld; Hans Lindel, Leverkusen, and Friedrich Berschauer, Wuppertal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

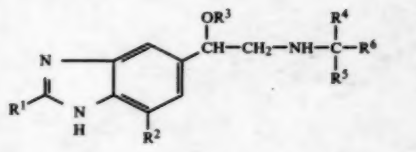
Filed Dec. 30, 1988, Ser. No. 292,581

Claims priority, application Fed. Rep. of Germany, Jan. 5, 1988, 3800096

Int. Cl.[5] **C07D** *235/08*

U.S. Cl. 514—387 **8 Claims**

1. A method of promoting the yield and growth of healthy animals which comprises administering to such animals a yield and growth promoting effective amount of a benzimidazole derivative of the formula



(I)

in which

R^1 stands for hydrogen, hydroxyl, alkyl or halogenoalkyl,

R^2 stands for hydrogen, alkyl, halogen, CN or halogenoalkyl,

R^3 stands for hydrogen, alkyl or acyl,

R^4 stands for hydrogen, alkyl or halogenoalkyl,

R^5 stands for alkyl or halogenoalkyl,

R^6 stands for alkyl or cycloalkyl, which is optionally substituted by halogen, cycloalkyl, OH, alkoxy, halogenoalkoxy or aryl, which can in turn be substituted by alkyl, halogen, CN or the radicals $-COR^7$, $-O-$alkylene-COR^7, -alkylene-R^8 or $-O-$alkylene-R^8,

R^7 stands for hydroxyl, alkoxy or $-NR^9R^{10}$,

R^8 stands for hydroxyl, alkoxy or $-NR^9R^{10}$,

R^9 stands for hydrogen or alkyl and

R^{10} stands for hydrogen or alkyl, or a physiologically tolerated salt thereof.

4,960,784

INSECTICIDAL SUBSTITUTED INDAZOLES

George P. Lahm, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

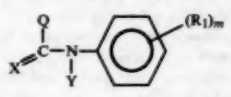
PCT No. PCT/US88/01004, § 371 Date Oct. 2, 1989, § 102(e) Date Oct. 2, 1989, PCT Pub. No. WO88/07994, PCT Pub. Date Oct. 20, 1988

Continuation of Ser. No. 159,763, Mar. 8, 1988, abandoned, which is a continuation-in-part of Ser. No. 36,480, Apr. 19, 1987, abandoned. This PCT application Apr. 5, 1988, Ser. No. 435,511

Int. Cl.[5] **A01N** *43/56, 43/90;* **C07D** *231/54, 471/04*

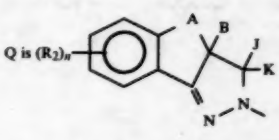
U.S. Cl. 514—403 **13 Claims**

1. A compound of the formula



I

wherein



Q is $(R_2)_n$

A is a 1, 2 or 3-atom bridge having 0 to 3 carbon atoms and 0 to 1 oxygen atom NR_6 group, or $S(O)_q$ group, wherein each carbon individual be substituted with 1 to 2 substituents selected from 1 to 2 halogen, C_1 to C_6 alkyl, C_2 to C_4 alkoxycarbonyl or phenyl optionally substituted with 1 to 3 substituents selected from W and one of the carbon atoms can be C(O) or C(S);

B is H C_1 to C_6 alkyl, C_1 to C_6 haloalkyl, C_2 to C_6 alkenyl, C_2 to C_6 haloalkenyl, C_2 to C_6 alkynyl, OR_7, C_2 to C_6 alkoxyalkyl, C_2 to C_6 cyanoalkyl, C_3 to C_8 alkoxycarbonylalkyl, CO_2R_3, $C(O)R_3$, $C(O)NR_3R_4$, $C(S)NR_3R_4$, $C(S)R_3$, $C(S)SR_3$, phenyl, phenyl substituted by $(R_5)_p$, benzyl, or benzyl substituted with 1 to 3 substituents independently selected from W;

J is H, C_1 to C_4 alkyl or phenyl optionally substituted with W;

K is H or CH_3;

W is halogen, CN, NO_2, C_1 to C_2 alkyl, C_1 to C_2 haloalkyl, C_1 to C_2 alkoxy, C_1 to C_2 haloalkoxy, C_1 to C_2 alkylthio, C_1 to C_2 haloalkylthio, C_1 to C_2 alkylsulfonyl or C_1 to C_2 haloalkylsulfonyl;

R_1, R_2 and R_5 are independently R_3, halogen, CN, N_3, SCN, NO_2, OR_3, SR_3, SOR_3, SO_2R_3, $OC(O)R_3$, OSO_2R_3, CO_2R_3, $C(O)R_3$, $C(O)NR_3R_4$, $SO_2NR_3R_4$, NR_3R_4, $NR_4C(O)R_3$, $OC(O)NHR_3$, $NR_4C(O)NHR_3$, $NR_4SO_2R_3$, or when m, n or p is 2, R_1, R_2 or R_5 can be taken together to form a 5 or 6 membered fused ring as $-OCH_2O-$, $-OCH_2CH_2O-$, or $-CH_2CH_2O-$, each of which can be substituted with 1 to 4 halogen atoms or 1 to 2 methyl groups;

R_3 is H, C_1 to C_6 alkyl, C_1 to C_6 haloalkyl, C_2 to C_6 alkenyl, C_2 to C_6 haloalkenyl, C_2 to C_6 alkynyl, C_2 to C_6 haloalkynyl, C_2 to C_6 alkoxyalkyl, C_2 to C_6 alkylthioalkyl, C_1 to C_6 nitroalkyl, C_2 to C_6 cyanoalkyl, C_3 to C_8 alkoxycarbonylalkyl, C_3 to C_6 cycloalkyl, C_3 to C_6 halocycloalkyl, phenyl, benzyl, or phenyl or benzyl substituted with 1 to 3 substituents independently selected from W;

R_4 is H, C_1 to C_4 alkyl or R_3 and R_4 can be taken together as $(CH_2)_4$, $(CH_2)_5$ or $(CH_2CH_2OCH_2CH_2)$;

R_6 is H, C_1 to C_4 alkyl, C_1 to C_4 haloalkyl, C_2 to C_4 alkenyl, C_2 to C_4 haloalkenyl, phenyl, benzyl, phenyl optionally substituted with W or benzyl optionally substituted with W;

R_7 is H, C_1 to C_4 alkyl, C_2 to C_4 alkenyl, C_2 to C_4 alkynyl, C_2 to C_4 alkylcarbonyl, C_2 to C_4 alkoxycarbonyl, C_1 to C_4 alkylsulfonyl;

X is O or S;

n is 1 to 4;

m is 1 to 5;

p is 1 to 3;

q is 0 to 2; and

Y i H, C_1 to C_6 alkyl, benzyl, C_2 to C_6 alkoxyalkyl, CHO, C_2 to C_6 alkylcarbonyl, C_2 to C_6 alkoxycarbonyl, C_2 to C_6 haloalkylcarbonyl, C_1 to C_6 alkylthio, C_1 to C_6 haloalkylthio, phenylthio, or phenylthio substituted with 1 to 3 substituents independently selected from W.

12. A composition comprising an insecticidally effective amount of a compound according to any one of claims 1 to 11 and an agriculturally suitable carrier therefor.

4,960,785

INDOLINONE DERIVATIVES

Harry R. Howard, Jr., Bristol, and Reinhard Sarges, Mystic, both of Conn., assignors to Pfizer Inc., New York, N.Y.

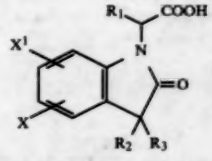
PCT No. PCT/US86/01429, § 371 Date Dec. 16, 1988, § 102(e) Date Dec. 16, 1988

PCT Filed Jun. 10, 1986, Ser. No. 346,115

Int. Cl.[5] **C07D** *209/34, 209/96, 491/056;* **A61K** *31/40*

U.S. Cl. 514—411 **26 Claims**

1. An oxindole-1-alkanoic acid compound of the formula:



or a C_1–C_6 alkyl ester or the N,N-di(unsubstituted) primary amide derivative thereof, or a base salt of said acid with a pharmacologically acceptable cation, wherein

X is hydrogen and X^1 is hydrogen, hydroxy, fluorine, chlorine, bromine, C_1–C_4 alkyl or C_1–C_4 alkoxy; or

X and X^1, when taken separately, are each chlorine, C_1–C_4 alkyl or C_1–C_4 alkoxy, and when taken together are

—$OCH_2(CH_2)_nO$— at the 4,5-, 5,6- or 6,7- positions of the molecule wherein n is zero or one;

R_1 is hydrogen or methyl;

R_2 is hydrogen, C_1–C_4 alkyl or phenylalkyl having up to three carbon atoms in the alkyl moiety wherein said phenylalkyl is optionally substituted with up to two chlorine substituents on the phenyl ring;

R_3 is naphthylmethyl, furfuryl, thenyl, benzothienylmethyl, benzoxazolylmethyl, benzothiazolylmethyl or phenylalkyl having up to three carbon atoms in the alkyl moiety wherein said phenylalkyl is optionally substituted with up to two identical or non-identical substituents on the phenyl ring, said identical substituents being fluorine, chlorine, bromine, trifluoromethyl, C_1–C_4 alkyl or C_1–C_4 alkoxy and said non-identical substituents being chlorine, methyl, methoxy or trifluoromethyl.

2. A pharmaceutical composition suitable for oral administration comprising a pharmaceutically acceptable carrier and a compound as claimed in claim 1 in an amount effective for the treatment of diabetes-associated chronic complications.

4,960,786

EXCITATORY AMINO ACID ANTAGONISTS

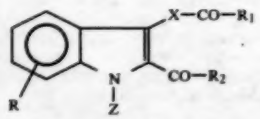
Francesco G. Salituro, Fairfield; Boyd L. Harrison, and Bruce M. Baron, both of Cincinnati, all of Ohio, assignors to Merrell Dow Pharmaceuticals Inc., Cincinnati, Ohio

Filed Apr. 24, 1989, Ser. No. 342,498

Int. Cl.[5] **A61K** *31/40*

U.S. Cl. 514—419 **47 Claims**

1. A method for antagonizing the effects of excitatory amino acids upon the NMDA receptor complex comprising administering to a patient in need thereof, an antagonistic amount of a compound of the formula:



in which X is represented by a C_{1-4} alkylene, Z is represented by H, C_{1-4} alkyl, phenyl, substituted phenyl, or an alkylphenyl substituent in which the phenyl ring may be optionally substituted; R is represented by a substituent selected from the group consisting of hydrogen, halogen, C_{1-4} alkyl, C_{1-4} alkoxy, CF_3, OCF_3, OH, NO_2, and CN; R_1 and R_2 are each independently represented by —OH, —OR_3 in which R_3 is represented by a C_{1-4} alkyl, phenyl, substituted phenyl or an alkylphenyl substituent in which the phenyl ring may be optionally substituted, NR_4R_5 in which R_4 and R_5 are each independently represented by hydrogen or a C_{1-4} alkyl, or OCH_2OR_3 in which R_3 is as defined above, and a pharmaceutically acceptable basic addition salt thereof.

4,960,787

CERTAIN PYRROLYL-SUBSTITUTED HYDROXAMIC ACID DERIVATIVES

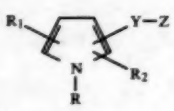
Jan W. F. Wasley, Chatham, N.J., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Feb. 6, 1989, Ser. No. 306,975

Int. Cl.[5] **A61K** *31/40*; **C07D** *207/34, 207/337*

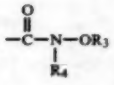
U.S. Cl. 514—423 **18 Claims**

1. A compound of the formula



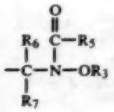
(I)

wherein R represents aryl, aryl-lower alkyl, cycloalkyl, bicycloalkyl or adamantyl; R_1 and R_2 represent hydrogen or lower alkyl; Y represents a direct bond, lower alkylene, lower alkenylene or lower alkadienylene; Z represents



(a)

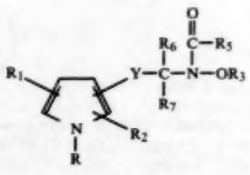
wherein R_3 represents hydrogen ore acyl; R_4 represents lower alkyl, C_3–C_7-cycloalkyl, aryl or aryl-lower alkyl; or Z represents



(b)

wherein R_3 represents hydrogen or acyl; R_5 represents lower alkyl, C_3–C_7-cycloalkyl, aryl, aryl-lower alkyl, amino or N-(mono- or di-lower alkyl)-amino; R_6 and R_7 represent hydrogen or lower alkyl; aryl in the above definitions represents phenyl or phenyl mono-, di- or tri-substituted by one, two or three substituents selected from hydroxy, lower alkyl, halogen, lower alkoxy, trifluoromethyl, cyano, carboxy, lower alkoxycarbonyl, carbomyl and N-(mono- or dialkyl)-carbamoyl; acyl represents lower alkanoyl or aroyl; and aroyl represents benzoyl or benzoyl mono- or di-substituted by one or two radicals selected from lower alkyl, lower alkoxy and halogen, or benzoyl monosubstituted by cyano or trifluoromethyl, or 1- or 2-naphthoyl; or a pharmaceutically acceptable salt thereof provided that R_3 represents hydrogen.

8. A compound according to claim 1 of the formula



(Ib)

wherein Y represents a direct bond, lower alkylene, lower alkenylene or lower alkadienylene; R represents aryl, aryl-lower alkyl, cycloalkyl, bicycloalkyl or adamantyl; R_1 and R_2 represent hydrogen or lower alkyl; R_3 represents hydrogen or acyl; R_5 represents lower alkyl, C_3–C_7-cycloalkyl, aryl, aryl-lower alkyl, amino or N-(mono- or dialkyl)-amino; R_6 and R_7 represent hydrogen or lower alkyl; or a pharmaceutically acceptable salt thereof provided that R_3 represents hydrogen.

4,960,788

PYRROLIDONE-2 COMPOUNDS AND THEIR USE FOR CENTRAL ANALGESIC ACTIVITY

Angelo Carenzi, Busto Arsizio; Dario Chiarino, Monza; Davide Della Bella, Milan; Gian Carlo Grancini, Nova Milanese, and Carlo Veneziani, Bresso, all of Italy, assignors to Zambon Group S.p.A., Vicenza, Italy

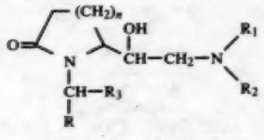
Filed May 19, 1989, Ser. No. 354,361

Claims priority, application Italy, May 20, 1988, 20648 A/88; Feb. 17, 1989, 19480 A/89

Int. Cl.[5] C07D *207/273;* A61K *31/40*

U.S. Cl. 514—424 8 Claims

1. A compound of the formula (I)



wherein

R is phenyl optionally substituted by 1 to 3 substituents selected from the group consisting of C_1–C_4 alkyl, C_1–C_4 alkoxy, hydroxy, halogen and trifluoromethyl;

R_1 and R_2, the same or different, are linear or branched C_1–C_6 alkyl or C_3–C_6 cycloalkyl;

R_3 is hydrogen or phenyl optionally substituted by 1 to 3 substituents selected from the group consisting of C_1–C_4 alkyl, C_1–C_4 alkoxy, hydroxy, halogen and trifluoromethyl; and

n is 1;

or a salt thereof with a pharmaceutically acceptable acid.

4,960,789

3-CYANO-4-PHENYL-PYRROLES

Detlef Wollweber, Wuppertal, and Wilhelm Brandes, Leichlingen, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

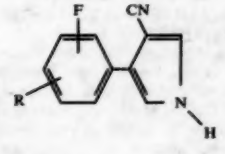
Filed Nov. 3, 1988, Ser. No. 266,966

Claims priority, application Fed. Rep. of Germany, Nov. 9, 1987, 3737984.4

Int. Cl.[5] A01N *47/40;* C07D *207/34;* C07B *37/10;* C07C *121/70*

U.S. Cl. 514—427 6 Claims

1. A 3-cyano-4-phenyl-pyrrole of the formula



in which

R stands for halogen, alkyl, alkoxy, alkylthio, halogenoalkyl, halogenoalkoxy or halogenoalkylthio.

5. A method of combating fungi comprising applying to said fungi or an environment thereof a fungicidally effective amount of at least one 3-cyano4-phenyl-pyrrole according to claim 1.

4,960,790

DERIVATIVES OF TAXOL, PHARMACEUTICAL COMPOSITIONS THEREOF AND METHODS FOR THE PREPARATION THEREOF

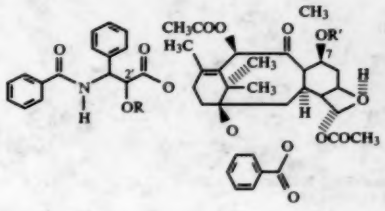
Valentino J. Stella, Lawrence, and Abraham E. Mathew, Lenexa, both of Kans., assignors to University of Kansas, Lawrence, Kans.

Filed Mar. 9, 1989, Ser. No. 321,152

Int. Cl.[5] A61K *31/335;* C07D *305/14*

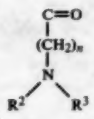
U.S. Cl. 514—449 34 Claims

1. A compound of the formula



(II)

wherein R and R′ are each H or the residue of an amino acid selected from the group consisting of alanine, leucine, isoleucine, valine, phenylalanine, proline, lysine and arginine or a group of the formula



(III)

wherein n is an integer of 1 to 3 and R^2 and R^3 are each hydrogen or an alkyl radical having from one to three carbon atoms or wherein R^2 and R^3 together with the nitrogen atom to which they are attached form a saturated heterocyclic ring having four or five carbon atoms or an acid addition salt thereof, with the proviso that at least one of R and R^1 is not hydrogen, and with the second proviso that said compound is not 2′-(β-alanyl)taxol.

13. A method according to claim 12, wherein said treatment comprises treating tumors selected from the group consisting of human lung tumors, melanoma, leukemia, mammary tumors and colon cancer.

4,960,791

SALANNIN DERIVATIVE INSECT CONTROL AGENTS

James A. Klocke, Salt Lake City, Utah, and Ronald B. Yamasaki, Sebastopol, Calif., assignors to NPI, Salt Lake City, Utah

Filed Dec. 16, 1988, Ser. No. 285,757

Int. Cl.[5] A61K *31/34;* C07D *307/93*

U.S. Cl. 514—468 28 Claims

1. 3-Deacetoxy-2′,3′,20,21,22,23,-hexahydrosalannin.

9. An insect antifeedant composition comprising an insect antifeedant effective amount of a 2′,3′,20,21,22,23-hexahydrosalannin derivative and an acceptable carrier.

4,960,792

CYCLOALKYL-SUBSTITUTED GLUTARAMIDE DIURETIC AGENTS

John C. Danilewicz, Nr. Canterbury, and Keith James, Deal, both of England, assignors to Pfizer Inc., New York, N.Y.

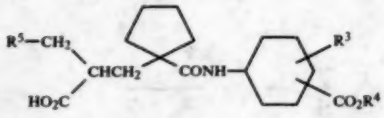
Filed May 8, 1989, Ser. No. 349,025

Claims priority, application United Kingdom, May 27, 1988, 8812597

Int. Cl.[5] C07C *101/36*; A61K *31/215*

U.S. Cl. 514—481 16 Claims

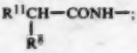
1. A compound having the formula:



wherein

R^3 and R^4 are each independently hydrogen or $(C_1–C_6)$alkyl;

R^5 is



R^8 is $R^9CONH—$ or $R^9SO_2NH—$;

R^9 is $(C_1–C_6)$alkyl, $(C_3–C_7)$cycloalkyl, naphthyl, phenyl or phenyl substituted by chloro, methyl or methoxy; and

R^{11} is hydrogen, $(C_1–C_6)$alkyl or $(C_1–C_6)$alkyl substituted by amino or benzyloxycarbonylamino; or

a pharmaceutically acceptable salt thereof.

4,960,793

DIETHYLENE GLYCOL MONOESTER DERIVATIVES, COMPOSITIONS AND THERAPEUTIC USE

Gunter Metz, Blaubeuren; Kurt Rauchle, Blaubeuren-Sonderbuch, and Manfred Erdmann, Neu-Ulm, all of Fed. Rep. of Germany, assignors to Merckle GmbH, Blaubeuren, Fed. Rep. of Germany

Filed Mar. 31, 1989, Ser. No. 331,124

Int. Cl.[5] A61K *31/25*; C07C *69/614*

U.S. Cl. 514—532 7 Claims

1. A diethylene glycol monoester of the antirheumatically effective acids of flurbiprofen, and the optically active isomers thereof.

2. A pharmaceutical composition comprising an anti-inflammatory effective amount of the diethylene glycol monoester of claim 1 and a pharmaceutically acceptable carrier.

4,960,794

TRIGLYCERIDES HAVING STABILITY WITH LAPSE OF TIME AND METHOD FOR STABILIZATION THEREOF

Nobuyuki Tsubaki, and Yoshio Nakano, both of Nishinomiya, Japan, assignors to Nippon Oil and Fats Co., Ltd., Tokyo, Japan

Filed Oct. 3, 1988, Ser. No. 252,633

Claims priority, application Japan, Oct. 8, 1987, 62-252369

Int. Cl.[5] A61K *31/225*; C07C *67/29, 3/02*

U.S. Cl. 514—547 34 Claims

1. A composition comprising triglycerides having stability with lapse of time comprising 10 to 30% by weight of an α type triglyceride polymorph, 20 to 40% by weight of a β' type triglyceride polymorph and 40 to 60% by weight of a β type triglyceride polymorph, the α type, β' type and β type triglyceride polymorphs making up 100% by weight, each % by weight being based on the total weight of the αtype, β' type and β type triglyceride polymorphs.

4,960,795

FEED ADDITIVE AND FEED CONTAINING SUCH ADDITIVE

Ragnal Salte, Sogndal, and Magny S. Thomassen, Oslo, both of Norway, assignors to Norsk Hydro a.s., Oslo, Norway

Filed Nov. 28, 1988, Ser. No. 276,854

Claims priority, application United Kingdom, Dec. 21, 1987, 8729751

Int. Cl.[5] A61K *31/20*; A23K *1/00*

U.S. Cl. 514—560 12 Claims

1. A fish feed for the prophylaxis or treatment of cell membrane dysfunction at low water temperatures in farmed fish, comprising (a) an effective amount, for the prophylaxis or treatment of cell membrane dysfunction at low water temperatures in farmed fish, of at least one n-3 polyunsaturated fatty acid or a dietary acceptable derivative thereof in admixture with (b) one or more conventional fish feed components.

4,960,796

CYCLOPROPANECARBOXAMIDES

Hans-Juergen Neubauer, Mannheim; Rainer Buerstinghaus, Telgte; Christoph Kuenast, Otterstadt, and Peter Hofmeister, Neustadt, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Apr. 1, 1988, Ser. No. 176,742

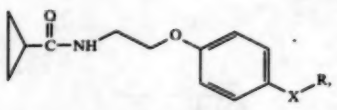
Claims priority, application Fed. Rep. of Germany, Apr. 3, 1987, 3711268

The portion of the term of this patent subsequent to Aug. 22, 2006, has been disclaimed.

Int. Cl.[5] A01N *53/00*; C07C *233/60, 323/40*

U.S. Cl. 514—624 5 Claims

1. Cyclopropanecarboxamides of the formula I



(I)

where the substituents have the following meanings:

R is selected from the group consisting of $C_1–C_{12}$-alkyl, $C_2–C_{12}$-alkenyl, $C_2–C_{12}$-alkynyl, $C_1–C_{12}$-haloalkyl, $C_2–C_{12}$-haloalkenyl, $C_2–C_{12}$-haloalkynyl, $C_3–C_{12}$-alkoxyalkyl, $C_3–C_8$-cycloalkyl, $C_4–C_{12}$-cycloalkylalkyl, $C_3–C_8$-halocycloalkyl, $C_4–C_{12}$-halocycloalkylalkyl, $C_4–C_{12}$-cycloalkylhaloalkyl or $C_4–C_{12}$-halocycloalkylhaloalkyl and

X is selected from the group consisting of oxygen or sulfur.

3. A process for combating pests which comprises: applying to the pests or to their habitat a pesticidally effective amount of a cyclopropanecarboxamide of the formula I as set forth in claim 1.

4,960,797

N-2[(4-FLUORO-PHENYL)-1-METHYL]-2-ETHYL-N-METHYL-N-PROPYNYL AMINE AND THE METHOD OF USE THEREOF

Zoltán Ecsery, deceased, late of Budapest (by Mária Escery née Jurkovich, Zoltán József Ecsery, heirs); József Knoll, Budapest; Éva Somfai, Budapest; Zoltán Török, Budapest; Éva Szinnyei, Budapest, and Károly Mozsolics, Sopron, all of Hungary, assignors to Chinoin Gyogyszer es Vegyeszeti Termekek Gyara Rt., Budapest, Hungary

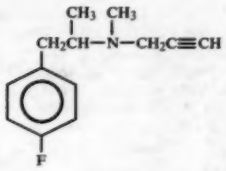
Continuation of Ser. No. 54,117, May 26, 1987, abandoned, which is a continuation-in-part of Ser. No. 840,565, Mar. 20, 1986, abandoned. This application Feb. 15, 1989, Ser. No. 311,436

Claims priority, application Hungary, May 31, 1984, 2124/84

Int. Cl.[5] A61K *31/135*; C07C *87/28*

U.S. Cl. 514—654 6 Claims

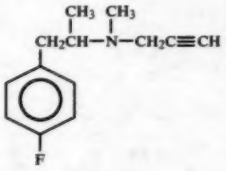
1. A compound of the Formula (I)



(I)

or a pharmaceutically acceptable acid addition salt thereof.

5. A method of treating a mammalian subject to counteract the consequences of decrease in brain dopamine concentration, to facilitate dopaminergic modulation in the brain without acting on the postsynaptic dopamine receptor by inhibiting selectively the B-type monoamine oxidase enzyme while also inhibiting tyramine and dopamine uptake, which comprises the step of administering to a mammalian subject in need of said treatment a therapeutically effective amount of the compound of the Formula (I)



(I)

or a pharmaceutically acceptable acid addition salt thereof.

4,960,798

METHODS FOR THE TREATMENT OF ANGINA

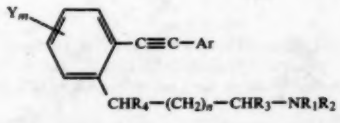
John R. Carson, Norristown, Pa., assignor to McNeilab, Inc., Spring House, Pa.

Division of Ser. No. 329,178, Mar. 27, 1989, Pat. No. 4,898,889, which is a continuation of Ser. No. 820,825, Jan. 21, 1986, abandoned, which is a continuation of Ser. No. 553,725, Nov. 21, 1983, abandoned. This application Jan. 26, 1990, Ser. No. 471,169

Int. Cl.[5] **A61K** *31/135, 31/40, 31/445, 31/535*

U.S. Cl. 514—654 **9 Claims**

1. A method for controlling angina pectoris in an animal which comprises administering to the animal a therpeutically effective amount of an acetylene of the following formula (I):



(I)

wherein

Y is independently alkyl, alkoxy, alkylthio, alkylsulfinyl, alkylsulfonyl, alkanoyloxy, alkanoylamino, amino, monoalkylamino, dialkylamino, hydroxy, halogen or cyano or methylenedioxy or ethylenedioxy at adjacent ring carbons;

Ar is phenyl or a 5- or 6-membered heterocyclic aromatic ring attached via a ring carbon to the acetylene moiety, which rings may be substituted independently by one or more of alkyl, alkoxy, alkylthio, alkylsulfinyl, alkylsulfonyl, carboxamido, halogen, fluoroalkyl or cyano;

R_1 and R_2 are independently hydrogen, alkyl, cycloalkyl or cycloalkyl or cycloalkylalkyl or R_1 and R_2 are alkyl and are joined to form a 5- to 7-membered staurated ring which ring may contain an oxygen or sulpur atom or an NR_5 moiety wherein R_5 is hydrogen or alkyl;

R_3 is hydrogen, alkyl or alkoxyalkyl;

R_4 is hydrogen or alkyl; and

n is 0, 1 or 2,

and the pharmceutically acceptable acid addition salts and the quaternary ammonium compounds thereof.

4,960,799

STABILIZED AQUEOUS SOLUTIONS OF PHARMACEUTICALLY ACCEPTABLE SALTS OF ORTHO-(2,6-DICHLOROPHENYL)-AMINOPHENYLACETIC ACID FOR OPTHALMIC USE

Ingrid E. Nagy, Berkeley Heights, N.J., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 244,547, Sep. 13, 1988, abandoned, which is a continuation of Ser. No. 166,795, Mar. 3, 1988, abandoned, which is a continuation of Ser. No. 945,702, Dec. 23, 1986, abandoned. This application Apr. 5, 1989, Ser. No. 333,772

Int. Cl.[5] **A61K** *31/195*

U.S. Cl. 514—567 **10 Claims**

1. A storage stable aqueous substantially isotonic solution of a pharmaceutically acceptable salt of ortho-(2,6-dichlorophenyl)aminophenylacetic acid for the treatment of ocular inflammation, said solution having a pH between about 7.0 and 7.8 and comprising, per ml solution:

(a) about 0.1 to about 5.0 mg of a pharmaceutically acceptable salt of ortho-(2,6-dichlorophenyl)amino)phenylacetic acid;

(b) about 0.1 to about 10 mg of a pharmaceutically acceptable salt of ethylenediamine tetraacetic acid;

(c) about 0.01 to about 5 mg of a pharmaceutically acceptable bacteriostat;

(d) about 0.5 to about 200 mg of a pharmaceutically acceptable solubilizer, or mixtures thereof; and

(e) the remainder water.

4,960,801

SYNTHESIS GAS TO HEAVY HYDROCARBONS ON SiO_2 PROMOTED CO/TiO_2

Enrique Iglesia, Clinton; Stuart L. Soled, Pittstown, and Rocco A. Fiato, Basking Ridge, all of N.J., assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Filed Aug. 29, 1988, Ser. No. 237,361

Int. Cl.[5] **C07C** *1/04*

U.S. Cl. 518—715 **7 Claims**

1. A process for preparing C_5+ hydrocarbons which comprises reacting hydrogen and carbon monoxide at hydrocarbon synthesis reaction conditions in the presence of a catalyst comprising cobalt in a catalytically active amount composited with an inorganic refractory support comprising a major portion of titania to which a lesser portion up to about 15 wt % silica in the form of silica or a silica precursor has been added.

4,960,802

CELLULAR VINYL ACETATE/ETHYLENE/N-METHYLOLACRYLAMIDE COPOLYMER CONTACT ADHESIVE

Frank V. DiStefano, Macungie, Pa., assignor to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Mar. 8, 1990, Ser. No. 490,182

Int. Cl.[5] **C08J** *9/8, 9/14, 9/30*

U.S. Cl. 521—72 **15 Claims**

1. An aqueous contact adhesive composition consisting essentially of

(a) an aqueous vinyl acetate/ethylene/N-methylolacrylamide copolymer emulsion,

(b) 0–20 wt % plasticizer, based on copolymer,

(c) 0.1–30 wt % colloidal silica, based on copolymer,

(d) 0–5 wt % acid catalyst, based on copolymer, and

(e) 1–30 wt % blowing agent, based on (a)–(d).

4,960,803

FIRE RETARDANT FOAM MATERIALS

Laszlo A. Muhl, 6547 Corintia St., Carlsbad, Calif. 92209; Thomas I. Omori, 1601 Parway Dr., Glendale, Calif. 91206, and John Milligan, 580 Gardina Ct., Encinitas, Calif. 92024

Continuation-in-part of Ser. No. 78,025, Jul. 24, 1987, abandoned, which is a continuation of Ser. No. 911,013, Sep. 29, 1986, abandoned. This application Jul. 29, 1988, Ser. No. 227,548

Int. Cl.[5] C08J *9/00*

U.S. Cl. 521—106 14 Claims

1. A fire retardant polyurethane foam, prepared by the process of reacting in the presence of a non-metallic catalyst,

(a) from about 80 parts to about 120 parts by weight of a polyol having a molecular weight of from about 200 to about 6000;

(b) from about 80 parts to about 120 parts by weight of a polyisocyanate;

(c) from about 10 parts to about 50 parts by weight of a foaming agent;

(d) from about 0.05 to about 2.0 parts by weight of a surfactant;

(e) a flame-retardant consisting essentially of from about 20 parts to about 200 parts by weight of a single salt consisting of ammonium phosphate having a particle size less than or equal to about 150 mesh.

4,960,804

RIGID FOAMS USING BLENDS OF CHLOROFLUOROCARBONS AND ALKYL ALKANOATES AS BLOWING AGENT

Herman P. Doerge, Pittsburgh, Pa., assignor to Mobay Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 321,032, Mar. 9, 1989. This application Mar. 30, 1990, Ser. No. 502,467

Int. Cl.[5] C08J *9/14*

U.S. Cl. 521—130 7 Claims

1. In a process for the preparation of closed cell, rigid foams by reacting (a) a polyol component having a hydroxyl number of from about 200 to about 650, and (b) an organic polyisocyanate, in the presence of (c) a catalyst, (d) a foam stabilizer, and (e) a blowing agent, the improvement wherein the blowing agent comprises of a mixture of (i) from 95 to 50 percent by weight of a chlorofluorocarbon having an atmospheric boiling point of from about 74° F. to about 120° F. and (ii) from 5 to 50 percent by weight of an alkyl alkanoate having a molecular weight of no more than about 88, the percents by weight being based on the total weight of said mixture.

4,960,805

IVORY-LIKE KEY MATERIAL AND A METHOD FOR PRODUCING THE SAME

Yutaka Oshima, Shizuoka, Japan, assignor to Yamaha Corporation, Japan

Filed Dec. 28, 1988, Ser. No. 291,054

Claims priority, application Japan, Dec. 28, 1987, 62-335735; Dec. 28, 1987, 62-335736

Int. Cl.[5] C08L *7/02, 9/10, 51/02, 89/00*

U.S. Cl. 524—26 8 Claims

1. An ivory-like key material comprising fine grains of hydroscopic elastic macromolecule dispersed in a matrix of casein resin, wherein said macromolecule is present in an amount of 1 to 50 parts per 100 parts by weight of the total of said casein and macromolecule and wherein said macromolecule is selected from the group consisting of polyurethane, polyamide, polyester, polyether, polyvinyl chloride, polyacrylonitrile, synthetic rubber emulsion, polyvinyl alcohol, polyvinyl pyrrolidone, polyethylene glycol, polymethyl cellulose, grafted starch, cellulose and natural rubber latex.

4,960,806

STRETCHED POLY(ARYLENE THIOETHER) BLOCK COPOLYMER FILMS AND PRODUCTION PROCESS THEREOF

Yoshikatsu Satake, Iwaki; Shinji Yamamoto, Urawa; Takashi Kaneko, Tokyo; Masahito Tada, Matsudo; Ken Kashiwadate, Iwaki; Toshiya Mizuno, Tsuchiura; Hiroyuki Endo, Chiyoda; Takayuki Katto, Iwaki, and Zenya Shiiki, Narashino, all of Japan, assignors to Kureha Kagaku Kagyo K.K., Tokyo, Japan

Filed Oct. 20, 1989, Ser. No. 424,625

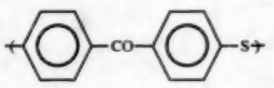
Claims priority, application Japan, Oct. 25, 1988, 63-267290; Nov. 15, 1988, 63-286836

Int. Cl.[5] C08K *5/35;* C08F *283/00;* C08G *14/00*

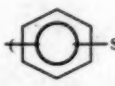
U.S. Cl. 524—100 8 Claims

1. A stretched poly(arylene thioether) block copolymer film, comprising thermoplastic material composed of:

(A) 100 parts by weight of a poly(arylene thioether) block copolymer (Component A) alternately comprising (X) at least one poly(arylene thioether-ketone) block having predominant recurring units of the formula



wherein the —CO— and —S— are in the para position to each other and (Y) at least one poly(arylene thioether) block having predominant recurring units of the formula



(a) the ratio of the total amount of the poly(arylene thioether) block (Y) to the total amount of the poly(arylene thioether-ketone) block (X) ranging from 0.05 to 5 by weight,

(b) the average polymerization degree of the one poly-(arylene thioether) block (Y) being at least 10, and

(c) said block copolymer having a melt viscosity of 50–100,000 poises as measured at 350° C. and a shear rate of 1,200/sec;

(B) optionally, not greater than 100 parts by weight of at least one other thermoplastic resin (Component B); and

(C) optionally, not greater than 15 parts by weight of at least one filler (Component C).

4,960,807

STABILIZED CARBON MONOXIDE OLEFIN COPOLYMER COMPOSITIONS

Edgar J. Smutny, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed May 15, 1989, Ser. No. 351,367

Int. Cl.[5] C08K *5/52*

U.S. Cl. 524—147 18 Claims

1. A composition stabilized against undue loss of crystallinity when subjected to melting and solidification which comprises:

a linear alternating polymer of carbon monoxide and at least one ethylenically unsaturated hydrocarbon, wherein the polymer is represented by the repeating formula

$$-CO-CH_2-CH_2)]_x[(CO-G)]_y$$

wherein G is the moiety of an ethylenically unsaturated hydrocarbon of at least 3 carbon atoms polymerized through the ethylenic unsaturation and the ratio of y:x is no more than about 0.5; and

a stabilizing quantity of a mixture of zinc oxide, zinc sulfide and a trialkylphosphite.

4,960,808

STABILIZED ETHYLENE MONOXIDE-OLEFIN COPOLYMERS

André Schmitter, Hegenheim, France, assignor to Shell Oil Company, Houston, Tex.

Filed Mar. 30, 1988, Ser. No. 175,022

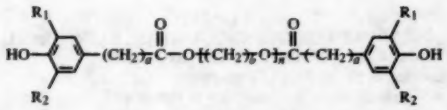
Claims priority, application United Kingdom, Apr. 29, 1987, 8710171

Int. Cl.[5] C08K *5/52, 5/20, 5/13*

U.S. Cl. 524—151 **32 Claims**

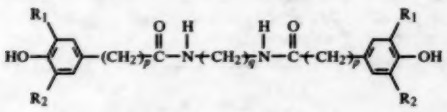
1. A composition stabilized against thermal degradation comprising a linear alternating polymer of carbon monoxide and at least one ethylenically unsaturated hydrocarbon and intimately mixed therewith a stabilizing quantity of a phenolic stabilizer selected from

(a) phenolic dicarboxylate of the formula



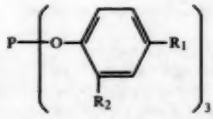
wherein a is an integer from 0 to 4 inclusive, b is an integer from 2 to 6 inclusive, n is an integer from 2 to 8 inclusive, R_1 independently is alkyl of from 1 to 6 carbon atoms inclusive and R_2 independently is R_1 or hydrogen,

(b) phenolic dicarboxamide of the formula



wherein p is an integer from 0 to 6 inclusive, q is an integer from 0 to 12 inclusive and R_1 and R_2 have the previously stated significance, and

(c) phenolic phosphite of the formula



wherein R_1 and R_2 have the previously stated significance.

4,960,809

PRIMER COMPOSITION

Masaaki Yamaya, Annaka; Kazuharu Sato, Gunma, and Masayuki Takahashi, Annaka, all of Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed Dec. 1, 1988, Ser. No. 278,593

Claims priority, application Japan, Dec. 4, 1987, 62-308373

Int. Cl.[5] C08K *5/54*

U.S. Cl. 524—188 **3 Claims**

1. A primer composition which comprises, in admixture, as dissolved in an organic solvent:

(a) 100 parts by weight of a copolymer of a monomer mixture composed of (a-1) from 2 to 50% by weight of an ethylenically unsaturated monomeric compound having, in a molecule, an alkoxysilyl group and (a-2) from 98 to 50% by weight of an ethylenically unsaturated monomeric compound free from alkoxysilyl groups and copolymerizable with the monomeric compound (a-1); and

(b) from 5 to 300 parts by weights of an amidated product obtained by the reaction of an amidating agent selected from the group consisting of acetyl chloride, acetyl bromide, propionyl chloride, butyryl chloride, acetic anhydride, isopropenyl acetate and benzoyl chloride and a product obtained by the reaction of an amino group-containing alkoxysilane compound and a silylating agent selected from the group consisting of the combinations of trimethyl chlorosilane and triethylamine, hexamethyl disilazane; N,N-bis (trimethylsilyl) formamide; and N,N-bis (trimethylsilyl) urea.

4,960,810

POLYMER COMPOSITIONS STABILIZED WITH POLYDIALKYLSILOXANES CONTAINING SILOXY UNITS HAVING CERTAIN DEFINED PENDANT STERICALLY HINDERED PHENOL MOIETIES

George N. Foster, Bloomsbury, N.J.; Herbert E. Petty, Bethel, Conn., and Charles H. Blevins, II., Beacon, N.Y., assignors to Union Carbide Chemicals and Plastics Company Inc., Danbury, Conn.

Filed Mar. 30, 1989, Ser. No. 330,810

Int. Cl.[5] C08K *5/24*

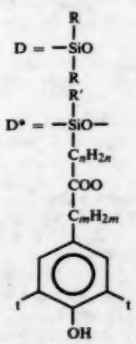
U.S. Cl. 524—265 **14 Claims**

1. An olefin polymer composition comprising an olefin polymer and a polysiloxane having pendant sterically hindered phenol moieties of the formula:

pendant sterically hindered phenol moieties of the formula:

$$MD_xD^*_yM \qquad (I)$$

wherein $M = R''R_2SiO_{\frac{1}{2}}$



R = phenyl or a lower alkyl group;

R′ = phenyl, phenethyl or an alkyl group having 1 to about 8 carbon atoms;

R″ = is phenyl, or an alkyl group or alkoxy group having from I to about 30 carbon atoms;

t = tert-butyl;

n has a value of from 0 to about 10;

m has a value of about 2 to about 10;

x has a value of from 0 to about 250; and

y has a value of from 2 to about 250.

4,960,811

FLUOROSILICONE COMPOSITIONS WITH IMPROVED ELASTIC RESPONSE

Edwin R. Evans, Clifton Park, N.Y., assignor to General Electric Company, Waterford, N.Y.

Filed Jun. 16, 1989, Ser. No. 367,402
Int. Cl.[5] C08K *5/24*
U.S. Cl. 524—265 **14 Claims**

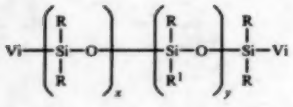
1. A fluorosilicone rubber composition comprising:

(A) 100 parts by weight of the reaction product of:

(1) 100 parts by weight of a fluorosilicone cyclic trimer;

(2) from about 0.5 to about 2.0 parts by weight of a chain modifier mixture comprising:

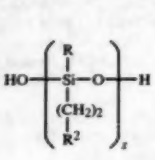
(a) from 20% to 96% by weight vinyl terminated polysiloxanes of the formula:



(I)

and

(b) from 4% to 80% by weight siloxanes of the formula:



(II)

wherein Vi is vinyl, R is selected from the class consisting of C_{1-4} alkyl and phenyl radicals; R^1 is R or $-(CH_2)_2-R^2$; R^2 is perfluoroalkyl of from 1 to 4 carbon atoms; x = 30 to 45; y = 15 to 30; and z = 3 to 6;

(3) from about 0.045 to about 0.065 parts by weight 1,3,5-trimethyl-b 1,3,5-trivinylsiloxane cyclic trimer; and

(4) sufficient sodium fluorosilanolate to provide 10 ppm of NaOH; and

(B) from about 1 to about 10 parts by weight of polydimethylsiloxane gum having approximately 3.2 weight percent vinyl groups;

4,960,812

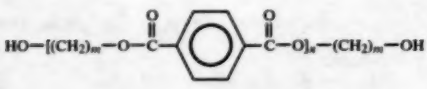
POLYESTER RESIN COMPOUND

Han S. Youn; Kim Dong, Il, and Choi I. Gyu, all of Jeonju, Rep. of Korea, assignors to Sam Yang Co., Ltd., Seoul, Rep. of Korea

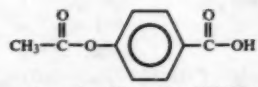
Filed Oct. 31, 1988, Ser. No. 265,236
Claims priority, application Rep. of Korea, Nov. 20, 1987, 13100
Int. Cl.[5] C08L *67/02*; C08K *5/09*
U.S. Cl. 524—291 **1 Claim**

1. A polyester resin comprising a polyethylene terephthalate resin with a viscosity of 0.4–1.0 dl/g, combined with:

(i) from about 0.5% to about 30% by weight of a co-polyester obtained from a polycondensation of a compound having the structure:



wherein m is independently 2 or 4, and n is an integer of from 1 to 100, and a compound having the structure:



combined in a molar ratio of from about 20/80 to about 80/20;

(ii) from about 0.01% to about 10% by weight of a metal salt or diol salt of p-hydroxybenzoic acid;

(iii) about 0.15% by weight of an inorganic filler selected from the group consisting of talc, titanium dioxide, calcium carbonate, and mica;

(iv) from about 0.1% to about 15% by weight of a lubricant selected from the group consisting of sodium stearte, magnesium stearate and neopentylglycol dibenzoate;

(v) from about 5% to about 50% by weight of a reinforcing glass fiber; and

(vi) from about 5% to about 30% by weight of a flame retardant.

4,960,813

INTERNAL LUBRICANT FOR GLASS REINFORCED POLYARYLENE SULFIDE

Lachhman H. Wadhwa, Branchberg, N.J., and Andrew M. Steurer, Kenton, Ky., assignors to Hoechst Celanese Corporation, Chatham, N.J.

Continuation of Ser. No. 159,804, Feb. 25, 1988, abandoned. This application Apr. 12, 1989, Ser. No. 336,506
Int. Cl.[5] C08K *5/11*
U.S. Cl. 524—311 **26 Claims**

1. A molding composition comprising polyarylene sulfide, fiber reinforcement and an effective amount up to about 2.0 wt.% of an internal lubricant sufficient to provide mold release properties to said composition, said internal lubricant comprising pentaerythritol tetrastearate.

4,960,814

WATER-DISPERSIBLE POLYMERIC COMPOSITIONS

Stephen H. W. Wu, Kingsport; Carol J. Greene, Mt. Carmel, and Mahendra K. Sharma, Kingsport, all of Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 13, 1988, Ser. No. 205,765
Int. Cl.[5] G08L *1/28*; A61K *9/32*
U.S. Cl. 524—312 **33 Claims**

1. A process for forming pseudolatices comprising:

contacting

(A) an organic solvent system comprising:

(a) at least one water insoluble polymer, and

(b) at least one low molecular weight, more volatile than water, and substantially water-immiscible organic solvent,

with

(B) a combination of surfactants comprising:

(i) at least one oil-in-water emulsifier which is polymeric, water soluble or water dispersible, and nonionic, and

(ii) at least one water-in-oil emulsifier which is water insoluble, anionic or amphoteric, more hydrophobic than said oil-in-water emulsifier, substantially dispersible in said organic solvent system, and compatible with said oil-in-water emulsifier,

to result in an organic phase,

wherein

Component (A) comprises about 5 to about 35 weight % of Component (A)(a) and about 95 to about 65 weight % of Component (A)(b), based on the total weight of (A)(a) plus (A)(b); and Component (B)(i) is present in an amount of about 0.5% to about 70% of the weight of Component (A)(a), and Component (B)(ii) is present in an amount of about 1% to about 65% of the weight of Component (A)(a).

4,960,815

ISOTOPICALLY-LABELED POLYCYCLIC AMINE DERIVATIVES

Walter H. Moos, Ann Arbor, Mich., assignor to Warner-Lambert Company, Morris Plains, N.J.

Continuation of Ser. No. 247,978, Sep. 22, 1988, abandoned. This application Jan. 17, 1990, Ser. No. 465,535

Int. Cl.[5] A61K *49/02*; C07C *211/00*

U.S. Cl. 424—1.1 4 Claims

1. A compound selected from the group consisting of:

1,2,3,4,9,9a-hexahydro-(N-methyl-^{11}C)-4aH-fluoren-4a-amine,

1,4,9,9a-tetrahydro-(N-methyl-^{11}C)-4a-fluoren-4a-amine,

1,4,9,9a-tetrahydro-(N-ethyl-(2-^{11}C)-4a-fluoren-4a-amine, and

1,4,9,9a-tetrahydro-(N-(3,3,3-trifluoropropyl-$^{18}F_3$))-4aH-fluoren-4a-amine.

4,960,816

SURFACE MODIFIED MINERAL COMPOSITIONS

Camilla A. Rice, Sandersville, Ga., assignor to ECC America Inc., Atlanta, Ga.

Continuation-in-part of Ser. No. 881,320, Jul. 22, 1986, abandoned, and a continuation-in-part of Ser. No. 943,669, Dec. 17, 1986, Pat. No. 4,789,403, and a continuation-in-part of Ser. No. 175,868, Mar. 31, 1988, Pat. No. 4,859,718, and a continuation-in-part of Ser. No. 263,689, Oct. 28, 1988, Pat. No. 4,900,767. This application Dec. 2, 1988, Ser. No. 279,210

The portion of the term of this patent subsequent to Dec. 6, 2005, has been disclaimed.

Int. Cl.[5] B32B *17/02, 19/00*; C08K *9/04, 3/34, 3/26*

U.S. Cl. 524—425 31 Claims

16. A composition comprising a filled polymer system comprising a matrix polymer and a filler, said filler comprising a particulate comprising a mineral selected from the group consisting of metal carbonates, glass fibers and layered lattice silicates, the surfaces of the particles of said particulate being modified by a polymer synthesized in situ on the mineral in the presence of a reactive gas selected from the group consisting of hydrogen, carbon monoxide and carbon dioxide; and said particulate having a predetermined particle size distribution which substantially corresponds to the particle size distribution of the surface-unmodified feed particulate from which the product particulate is produced.

4,960,817

HIGH-TEMPERATURE, CORROSION-PREVENTIVE COATING

Stephen J. Spadafora, Willow Grove, Pa., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 31, 1989, Ser. No. 331,705

Int. Cl.[5] C08K *3/08*

U.S. Cl. 524—440 9 Claims

1. A corrosion-preventive coating which is thermally stable up to 700° F., comprising:

a silicone resin prepared from multifunctional organo-silanes with a trifunctional monomer content between approximately 35% and 55%, for providing high-temperature binder properties;

a silicone alkyd co-polymer resin with a minimum linseed oil content of 27% and a maximum acid number of 15, for providing ambient-temperature binder properties;

organic solvent for maintaining the coating in a liquid state until application;

a sacrificial anodic particle pigment for providing chemical protection against corrosion; and

a leafing pigment for providing barrier protection against corrosion.

4,960,818

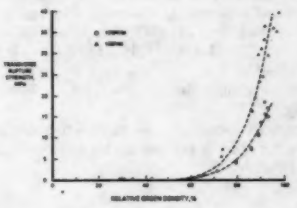
POLYMER COMPOSITE PREFORM AND PROCESS FOR PRODUCING SAME

John J. Reilly, Elkins Park, and Ihab L. Kamel, Drexel Hill, both of Pa., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 25, 1989, Ser. No. 343,106

Int. Cl.[5] C08K *3/08*; C08L *71/00*

U.S. Cl. 524—440 21 Claims



1. A method of producing a semicrystalline polymer composite preform which has high strength and low electrical resistivity, comprising the steps of: commingling particles of a polyether-etherketone powder and a

hard metal powder to form a powder a blend; and compacting the powder blend below the glass transition

temperature of polyether-etherketone and at a pressure sufficient to achieve a relative green density of at least 60%.

4,960,819

FAST CURING RUBBER BLEND

Paul H. Sandstrom, Tallmadge, and Emil M. Friedman, Cleveland Heights, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Continuation-in-part of Ser. No. 748,286, Jun. 24, 1985. This application Jul. 14, 1989, Ser. No. 380,046

Int. Cl.[5] C08L *7/00, 9/00, 9/06, 39/08*

U.S. Cl. 524—516 21 Claims

1. A fast curing rubber blend comprising:

(a) from 50 to 98 weight percent of at least one polydiene rubber, and

(b) from 2 to 50 weight percent of at least one vinylpyridine copolymer comprised of repeat units which are derived from a diene monomer and vinylpyridine wherein from 1 to 75 weight percent of the repeat units in said vinylpyridine copolymer are derived from vinylpyridine; wherein the product of the weight fraction of vinylpyridine copolymer in said rubber blend and the weight fraction of repeat units derived from vinylpyridine in said vinylpyridine copolymer is between about 0.001 and about 0.1; and wherein the fast curing rubber blend does not contain a significant amount of dicumyl peroxide or lead oxide.

4,960,820

COMPOSITIONS AND ARTICLES USING HIGH MELT FLOW POLY-1-BUTENE AND POLYPROPYLENE BLENDS

Charles C. Hwo, Sugar Land, Tex., assignor to Shell Oil Company, Houston, Tex.

Continuation-in-part of Ser. No. 198,548, May 24, 1988, abandoned. This application Feb. 27, 1989, Ser. No. 316,258

Int. Cl.[5] C08L *23/20, 23/12*; C08K *3/00, 5/00*

U.S. Cl. 524—528 35 Claims

1. A composition comprising a blend of a low molecular weight, isotactic poly-1-butene polymer with a melt index in the range of greater than 100 to about 1000, said poly-1- butene polymer amounting to less than 10% by weight, but being

present in an amount sufficient to improve the gloss and clarity of the propylene polymer, and at least
of a propylene polymer. 90% by weight of a propylene polymer and an intrinsic viscosity of less than about 0.11.

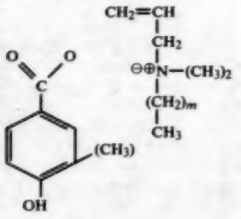
4,960,821

COMPATIBLE MIXTURES OF CATIONIC VISCOELASTIC MONOMER FLUIDS AND CATIONIC-ALKYL CONTAINING COPOLYMERS

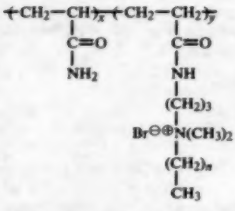
Dennis G. Peiffer, East Brunswick, N.J., assignor to Exxon Research and Engineering Company, Florham Park, N.J.

Filed Dec. 21, 1987, Ser. No. 135,824
Int. Cl.[5] C08L *51/00*
U.S. Cl. 524—534 **5 Claims**

1. A solution comprising:
(a) water
(b) about 0.1 to about 2.0 wt. % of a mixture of:
(i) a water soluble polymerizable monomer characterized by the formula:



wherein m is 6 to 22; and
(ii) a water soluble copolymer characterized by the formula:



wherein n is 6 to 22, x is about 90.0 to 99.9 mole %, y is about 10.0 to 0.1 mole %, wherein the weight ratio of monomer to copolymer is about 10/1 to about 1/10.

4,960,822

THERMOPLASTIC MOULDING COMPOUNDS WITH GOOD PROCESSING PROPERTIES AND GREAT TOUGHNESS

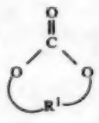
Herbert Eichenauer; Edgar Leitz, both of Dormagen; Karl-Heinz Ott, Leverkusen, and Alfred Pischtschan, Kuerten-Eichhof, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Mar. 6, 1989, Ser. No. 319,275
Claims priority, application Fed. Rep. of Germany, Mar. 17, 1988, 3808844
Int. Cl.[5] C08L *69/00, 55/02, 51/04, 35/00*
U.S. Cl. 525—67 **6 Claims**

1. Thermoplastic moulding compounds comprising
(A) from 5–90 parts by weight of one or more thermoplastic polymers of styrene, α-methylstyrene styrene substituted in the nucleus, methylmethacrylate, acrylonitrile, maleic acid anhydride, N-substituted maleimide vinyl acetate, and mixtures thereof
(B) from 5–90 parts by weight of one or more graft polymers of
(B.1) from 5–90 parts by weight of styrene, α-methylstyrene, styrene substituted in the nucleus, methylmethacrylate, acrylonitrile, methacrylonitrile, maleic acid anhydride, N-substituted maleimide, vinyl acetate or mixtures thereof on
(B.2) from 95 to 10 parts by weight of a rubber having a glass temperature of ≦10° C. and
(C) from 0.25–40 parts by weight of a copolymer having an sequential structure corresponding to the idealized formula (I)

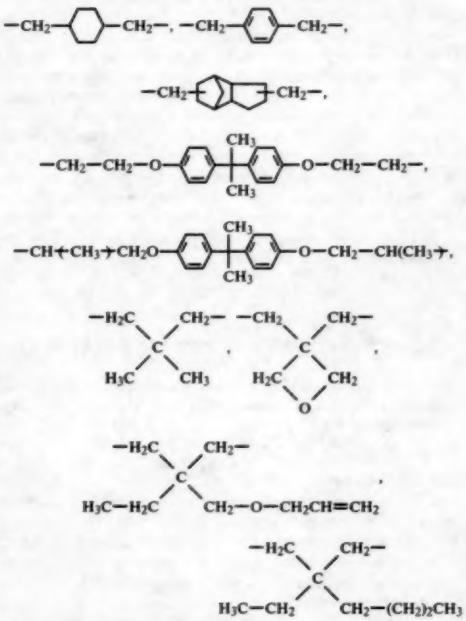
$$(A—X—B)_n \qquad (I),$$

wherein
n=1 to 20, and A=a polymer of a cyclic carbonate corresponding to the formula (II)

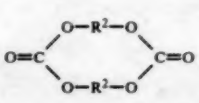


(II)

wherein
R^1=$—(CH_2)_n—$ where n=3–12, $—CH_2CH_2CH(CH_3)—$, $—CH_2CH_2OCH_2CH_2—$, $—CH_2CH_2OCH_2CH_2OCH_2CH_2—$, $—CH_2CH(CH_3)CH_2CH_2C(CH_3)_2CH_2—$,

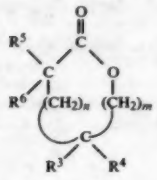


or corresponding to formula (III)



(III)

B=a polymer of a cyclic ester corresponding to formula (IV) ("Block B")



(IV)

wherein

R^3, R^4, R^5 and R^6=H, C_1–C_6-alkyl, C_3–C_6-alkenyl, C_1–C_6-alkoxy or C_1–C_6-alkenoxy-C_1–C_6-alkyl, in particular H, CH_3 or C_2H_5, and

m and n denote, independently of one another, 0, 1, 2, 3, 4, 5 or 6,

X=the middle member containing both the cyclic carbonate corresponding to formula (II) or (III) or both and the cyclic ester corresponding to formula (IV) in polymerized form, the concentration of the structural units of compounds (II) or (III) or both continuously decreasing in the direction of -B- and the concentration of the structural units of compounds (IV) continuously decreasing in the direction of -A- ("tapered structure"), and the proportion of blocks A amounting to from 47.5 to 99% by weight (based on the total quantity of blocks A+B), the proportion of blocks B amounting to from 52.5 to 1% by weight (based on the total quantity of blocks A+B) and the proportion of middle members X amounting to from 5 to 95% by weight (based on the total quantity of A+B+X).

4,960,823

RESIN COMPOSITION FOR BUMPERS

Masato Komatsu, Hanno; Masaaki Isoi, Saitama; Isao Baba, Yokohama, and Takashi Mikami, Komae, all of Japan, assignors to Tonen Sekiyukagaku Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 12, 1990, Ser. No. 479,020

Claims priority, application Japan, Feb. 13, 1989, 1-33211

Int. Cl.[5] C08L *53/00, 23/16, 23/06*

U.S. Cl. 525—89 **1 Claim**

1. A resin composition for bumpers comprising:

(a) 50–65 parts by weight of a propylene-ethylene block copolymer comprising:

(i) 60–75 weight % of a propylene-ethylene block copolymer having an ethylene content of 4–20 weight % and a melt flow rate of 9–30 g/10 min (230° C., 2.16 kg load), and

(ii) 40–25 weight % of a propylene-ethylene block copolymer having an ethylene content of 4–20 weight % and a melt flow rate of 40–80 g/10 min (230° C., 2.16 kg load);

(b) 40–25 parts by weight of an ethylene-propylene copolymer rubber and/or an ethylene-propylene-diene terpolymer rubber each having an ethylene content of 50–80 weight % and a Mooney viscosity ML_{1+4} (100° C.) of 80 or less; and

(c) 10–15 parts by weight of high-density polyethylene having a melt index of 1–20 g/10 min (190° C., 2.16 kg load),

(a)+(b)+(c) being 100 parts by weight.

4,960,824

STORAGE STABLE POLYIMIDE PRECURSOR SOLUTIONS AND METHOD OF PREPARATION

Daniel R. Olson, Watervliet, and Elbridge A. O'Neil, Jr., Port Henry, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Sep. 26, 1988, Ser. No. 248,762

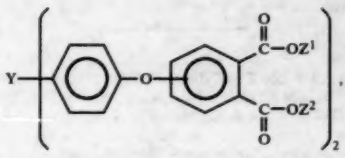
Int. Cl.[5] C08L *79/04*

U.S. Cl. 524—600 **29 Claims**

1. A method for preparing a storage stable polyimide precursor composition which comprises blending, at a temperature up to about 50° C.:

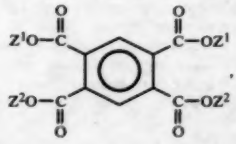
(A) at least one diamine selected from the group consisting of m-phenylenediamine, p-phenylenediamine and 4-aminophenyl ether;

(B) tetracarboxylic acid diester of the formula



(I)

or a mixture thereof with a tetracarboxylic acid diester of the formula



(II)

said mixture containing up to about 50 mole percent of the diester of formula II; and

(C) an amount of at least one alkanol of the formula ROH to provide a solution containing reagents A and B, or any reaction products of any of reagents A, B and C, in the amount of up to about 80% by weight;

wherein R is an alkyl radical containing about 1–4 carbon atoms, Y is a linear or branched alkylene radical containing about 1–6 carbon atoms, and one of Z^1 and Z^2 is R and the other is hydrogen.

4,960,825

POLYMER MIXTURE COMPRISING POLYPHENYLENE ETHER AND POLYAMIDE

Roelof van der Meer, Halsteren, Netherlands, assignor to General Electric Company, Selkirk, N.Y.

Filed Jun. 27, 1988, Ser. No. 211,961

Claims priority, application Netherlands, Jun. 29, 1987, 8701517

Int. Cl.[5] C08L *53/02, 71/12*

U.S. Cl. 525—92 **5 Claims**

1. A polymer mixture which comprises a polyphenylene ether, a polyamide and an agent to improve the impact strength, characterised in that the polymer mixture comprises as an agent to improve the impact strength a mixture consisting of at least

(a) 10–90 parts by weight of a partially hydrogenated diene-vinylaromatic diblock copolymer

(b) 90–10 parts by weight of a partially hydrogenated diene-vinylaromatic polyblock copolymer having at least three blocks, the parts by weight being indicated per 100 parts by weight of (a) plus (b).

4,960,826

MELAMINE-CONTAINING RESOLE RESITOL AND RESITE COMPOSITIONS

Wayne R. Walisser, Floyd Knobs, Ind., assignor to Borden, Inc., Columbus, Ohio

Filed Feb. 19, 1988, Ser. No. 157,975

Int. Cl.[5] C08K *7/14;* **C08G** *14/10*

U.S. Cl. 524—494 **32 Claims**

1. A composition of matter comprising a res(ole)(itol)(ite)-melamine composition, including an essentially aqueous A-

stage form of said resolemelamine composition containing residues of free melamine(s) to aldehyde(s) to phenolic compounds(s) in a molar equivalent ratio ranging from about 0.2:1.5:1 to 0.8:3.5:1, which A-stage form is low temperature safe-storage stable, has a cloud point temperature of about 5° C. or less at the time of formation and is essentially infinitely water soluble.

8. The composition of claim 7 which exists in conjunction with and about a mineral fiber matrix.

4,960,827

CURABLE RESIN COMPOSITION

Nobuyuki Miyazaki; Takashi Takayanagi, and Masashi Matsuo, all of Yokohama, Japan, assignors to Asahi Glass Company, Ltd., Tokyo, Japan

Continuation of Ser. No. 813,001, Dec. 24, 1985, abandoned. This application Apr. 7, 1988, Ser. No. 180,588

Claims priority, application Japan, Dec. 27, 1984, 59-273725

Int. Cl.[5] C08L *75/00*; C08F *18/00*

U.S. Cl. 525—131 3 Claims

1. A curable resin composition comprising (1) a fluoroolefin-alkylvinylether copolymer containing at least 10% by weight of fluorine based on the fluoroolefin unit, and having curable reactive sites, (2) an isocyanate or melamine curing agent, and (3) a C_3–C_{15} perfluorocarbon chain-containing compound which differs from (1) having a function group reactive with the curing agent, wherein the curable reactive sites of the fluoroolefin-alkylvinylether copolymer are hydroxy groups and the C_3–C_{15} perfluorocarbon chain-containing compound which differs from (1) is an alcohol having a C_3–C_{15} perfluoroalkyl group and a hydroxyl functional group.

4,960,828

SCRATCH RESISTANT TOP COATING COMPOSITION

Tetsuo Higuchi, Aichi; Sachio Yamaguchi, Hiratsuka; You Sugimura, Odawara; Shinji Sugiura, Fujisawa, and Shigeru Nakamura, Owariasahi, all of Japan, assignors to Kansai Paint Company, Limited, Amagasaki and Toyota Jidosha Kabushiki Kaisha, Toyota, both of, Japan

Filed Aug. 5, 1988, Ser. No. 228,648

Claims priority, application Japan, Aug. 7, 1987, 62-198903; Aug. 7, 1987, 62-198904; Aug. 7, 1987, 62-198905

Int. Cl.[5] C08L *29/02*; C08F *20/00*

U.S. Cl. 525—162 8 Claims

1. A top coating composition comprising

(A) a low molecular weight polyol resin selected from the group consisting of a polyester polyol and an acrylic polyol and having a weight average molecular weight as determined by gel permeation chromatography in the range of about 400 to 2,000 with a molecular weight distribution in terms of the ratio of weight average molecular weight ($\overline{M}w$) to number average molecular weight ($\overline{M}n$) of not more than about 1.6, and having a hydroxyl value in the range of about 150 to about 400 mg KOH/g,

(B) at least one polyol resin selected from the group consisting of

(1) a polyester polyol having a weight average molecular weight as determined by gel permeation chromatography of about 2,000 to about 50,000, a hydroxyl value of about 50 to about 200 mg KOH/g, and a cyclohexylene ring content of not less than about 7 percent by weight,

(2) an acrylic polyol resin containing about 20 to about 60 percent by weight of at least one member selected from the group consisting of acrylic and methacrylic esters of a monohydric alcohol of 6 to 18 carbon atoms, and having a weight average molecular weight as determined by gel permeation chromatography of about 5,000 to about 50,000 and a hydroxyl value of about 50 to about 180 mg KOH/g, and

(3) a mixed polyol resin consisting of a non-aqueous dispersion type acrylic resin prepared by dispersion-polymerizing at least one vinyl monomer in the presence of a polymer dispersion stabilizer and an organic solvent, and a solution type acrylic polyol resin having a weight average molecular weight as determined by gel permeation chromatography of about 5,000 to about 50,000 and a hydroxyl value of about 50 to about 180 mg KOH/g, and

(C) an alkoxy monomeric melamine, wherein the (A) component accounts for about 15 to about 60 percent by weight, the (B) component about 15 to 60 percent by weight, and the (C) component about 20 to about 50 percent by weight based on the total weight of components (A), (B) and (C).

4,960,829

ELASTOMERIC COMPOSITION

Ralph D. Allen, Naugatuck; Seshan Thiruvengada, Seymour; Frank C. Cesare, Woodbury, and Harry D. Visser, Cheshire, all of Conn., assignors to Uniroyal Chemical Company, Inc., Middlebury, Conn.

Continuation of Ser. No. 866,854, May 23, 1986, abandoned. This application Jul. 25, 1988, Ser. No. 223,749

The portion of the term of this patent subsequent to Jun. 27, 2006, has been disclaimed.

Int. Cl.[5] C08L *9/00, 23/16, 23/26*

U.S. Cl. 525—193 6 Claims

1. A solvent-free, curable elastomeric molding composition resistant to weight loss through extraction comprising:

(a) in the absence of a solvent, an uncured ethylene-propylene polymer as high molecular weight hydrocarbon elastomer in said composition, said polymer having a non-conjugated diene content of between 0 and about 20 weight percent, and having a molecular weight of at least about 40,000;

(b) between about 5 and 25 weight percent based on (a) plus (b) of a low molecular weight ethylene/alphaolefin/non-conjugated polyene terpolymer which is liquid at ambient temperatures, having an ethylene content between 25 and 85 percent by weight and a molecular weight between about 1,000 and about 15,000, said low molecular weight terpolymer being catalyzed using a vanadium salt and alkyl aluminum halide catalyst with a molecular weight regulator selected from the group consisting of phosphorodithioate, dithiocarbamate and dithiocarbonate, said low molecular weight polymer in said composition; and

(c) a sufficient amount of curative intimately admixed to cure the uncured high molecular weight hydrocarbon elastomer and the low molecular weight terpolymer, and to provide resistance to weight loss through minimal extraction of said low molecular weight terpolymer.

4,960,830

DYNAMICALLY CURED THERMOPLASTIC OLEFIN POLYMERS

Donald R. Hazelton, Chatham; Robert C. Puydak, Cranbury, both of N.J., and D. A. Booth, Overijse, Belgium, assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Division of Ser. No. 874,702, Jun. 16, 1986, Pat. No. 4,845,145, which is a division of Ser. No. 629,635, Jul. 11, 1984, Pat. No. 4,607,074. This application Jun. 20, 1989, Ser. No. 368,783

Int. Cl.[5] C08L *11/00, 15/02, 23/16, 23/26*

U.S. Cl. 525—196 12 Claims

1. A thermoplastic composition comprising a first rubber wherein said first rubber is a crystalline EPDM have a crystallinity of at least 2 wt % as measured by X-ray diffraction and a second rubber, selected from the groups consisting of at least one of halogenated butyl rubber and polychloroprene rubber was inserted, said second rubber being intimately mixed with said first rubber and being vulcanized utilizing a vulcanizing agent which is a vulcanizing agent for the second rubber but not a vulcanizing agent for the first rubber, said second rubber being vulcanized to a fully vulcanized state by dynamic vulcanization while in intimate contact with the first rubber.

4,960,831

BLOCK COPOLYMER GRAFTING PROCESS

Carl L. Willis; Michael F. Conway, both of Houston, Tex., and Michael K. Martin, Woodbury, Minn., assignors to Shell Oil Company, Houston, Tex.

Division of Ser. No. 225,995, Jul. 29, 1988, abandoned, which is a division of Ser. No. 946,269, Dec. 24, 1986, abandoned. This application Aug. 24, 1989, Ser. No. 398,298

Int. Cl.[5] C08F *8/10*; C08C *19/28*

U.S. Cl. 525—250 4 Claims

1. A method for preparing an elastomeric polymer containing at least one functional group comprising the steps of:

(a) contacting an elastomeric homopolymer or copolymer molecule comprising one active group containing an alkali metal compound with 1,1-diphenylethylene;

(b) reacting the product from step (a) with carbon dioxide; and

(c) recovering an elastomeric polymer molecule containing a carboxyl group.

4,960,832

POLYMER-SUPPORTED ALKYL AZODICARBOXYLATES AND THEIR USE IN MITSUNOBU REACTIONS

Lee D. Arnold, Streetsville, and John C. Vederas, Edmonton, both of Canada, assignors to The Governors of the University of Alberta, Edmonton, Canada

Filed Apr. 27, 1988, Ser. No. 189,410

Claims priority, application United Kingdom, Apr. 27, 1987, 8709887

Int. Cl.[5] C08F *8/30*

U.S. Cl. 525—328.8 8 Claims

1. An insoluble azodicarboxylate composition comprising the immobilization of azodicarboxylates on an insoluble solid polymer support.

4,960,833

RUBBER COMPOSITION WITH NITROGEN AND PHOSPHOROUS COMPOUND

Hideo Nagasaki, Osaka, and Yasuzi Takemoto, Sakai, both of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Division of Ser. No. 20,227, Mar. 2, 1987, Pat. No. 4,803,250, which is a continuation of Ser. No. 814,881, Dec. 30, 1985, abandoned. This application Nov. 14, 1988, Ser. No. 270,803

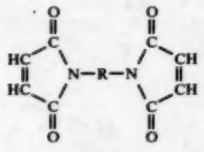
Claims priority, application Japan, Jan. 19, 1985, 60-7888; Jan. 22, 1985, 60-10226

Int. Cl.[5] C08C *19/24, 19/22*

U.S. Cl. 525—329.3 5 Claims

1. A rubber composition containing

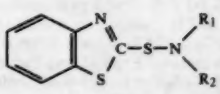
(A) a bismaleimide compound represented by the general formula (I)



(I)

wherein R is a divalent acyclic aliphatic group, cyclic aliphatic group, aromatic group, or alkylaromatic group, and wherein these groups may contain a hetero atom selected from O, N and S,

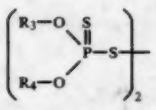
(B) a sulfenamide compound represented by the general formula (II)



(II)

wherein R_1 and R_2 denote independently from each other a hydrogen atom, an acyclic aliphatic group, or cyclic aliphatic group, or R_1 and R_2 together denote a chain aliphatic group which may contain an oxygen atom, provided that R_1 and R_2 cannot simultaneously denote a hydrogen atom,

(C) a dithiophosphoric acid compound represented by the general formula (III)



(III)

wherein R_3 and R_4 denote each an aliphatic group, and

(D) sulfur,

wherein the rubber is at least one member selected from the group consisting of styrene-butadiene rubber, butadiene rubber, isoprene rubber, acrylonitrile-butadiene rubber, chloroprene rubber, ethylene-propylene-diene terpolymer, and isopreneisobutylene rubber, and which composition contains 0.1 to 8 parts by weight of the bismaleimide compound (I), 0.1 to 8 parts by weight of the sulfenamide compound (II), 0.3 to 6 parts by weight of the dithiophosphoric acid compound (III), and 0.1 to 14 parts by weight of sulfur, each based on 100 parts by weight of rubber.

4,960,834

CARBOXYLATED SYNDIOTACTIC 1,2-POLYBUTADIENE

Lawson G. Wideman, Tallmadge, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Division of Ser. No. 176,577, Apr. 1, 1988, Pat. No. 4,912,145. This application Jan. 8, 1990, Ser. No. 461,955

Int. Cl.[5] C08F *8/06*

U.S. Cl. 525—333.2 21 Claims

1. The carboxylated syndiotactic 1,2-polybutadiene made by [the method specified in claim 1] a process which comprises: (1) reacting syndiotactic 1,2-polybutadiene with hydrogen and carbon monoxide in an organic medium to produce formyl syndiotactic 1,2-polybutadiene, wherein the syndiotactic 1,2-polybutadiene is in the form of small particles having a particle size of less than about 250 microns which are suspended in the organic medium; and (2) reacting the formyl syndiotactic 1,2-polybutadiene with oxygen to produce the carboxylated syndiotactic 1,2-polybutadiene.

4,960,835

PREPARATION OF ORGANIC POLYMERS USING ORGANOMETALLIC TERMINATED BLOCKS TO PRODUCE METAL FREE BLOCK COPOLYMERS

Ian D. H. Towle, Cirencester, England, and Patrick J. Horner, Menlo Park, Calif., assignors to Raychem Limited, Swindon, England

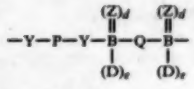
Division of Ser. No. 257,159, Oct. 12, 1988, Pat. No. 4,845,179, which is a continuation of Ser. No. 163,225, Feb. 26, 1988, abandoned, which is a continuation of Ser. No. 900,473, Aug. 22, 1986, abandoned, which is a continuation-in-part of Ser. No. 833,656, Feb. 21, 1986, abandoned, which is a continuation of Ser. No. 704,452, Feb. 21, 1985, abandoned. This application May 23, 1989, Ser. No. 355,936

Claims priority, application United Kingdom, Feb. 27, 1984, 8405049

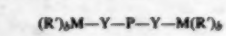
Int. Cl.[5] C08G *63/22, 63/34, 63/62, 63/64*

U.S. Cl. 525—398 25 Claims

1. A method of preparing a block copolymer having blocks of the formula



comprising reacting a first polymer block



where

each M is independently tin, germanium, lead, or thallium;

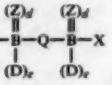
each R′ is independently a substituted or unsubstituted alkyl or aryl group;

each Y is independently oxygen, sulfur, or substituted nitrogen or phosphorus;

each b is an integer one less than the valence of the element M to which it pertains;

P is a divalent polyolefin, polyester, polyamide, polyphenylene ether ketone, polyalkylene ether ketone, polytetrahydrofurane, polydimethylsiloxane, polymethylphenylsiloxane, polyphenylene ether sulfone, polyalkylene ether sulfone, polycarbonate, or polyurethane polymeric group;

with a second polymer block



where

each X is independently halide, imidazole, RO—, RS—, or a group capable of reacting with the first reactant to eliminate a by-product containing M and X, R being a substituted or unsubstituted aromatic or aliphatic group or hydrogen;

each B is independently carbon, phosphorus, sulfur, silicon, or a direct bond;

each Z is independently oxygen, sulfur, or an imino group;

each D is independently an aromatic, aliphatic, RO—, RS—, or R_2N— group if B is phosphorus and an aryl, alkyl, or RO— group if B is silicon;

each d is independently 1 if B is carbon; 0 or 1 if B is phosphorus; 0, 1 or 2 if B is sulfur; and 0 if B is silicon or a direct bond;

each e is independently 0 if B is carbon, sulfur, or a direct bond; 1 if B is phosphorus; and 2 if B is silicon; and

Q is a divalent polyester, polyamide, polyphenylene ether ketone, polyphenylene ether sulfone, polycarbonate, polydimethylsiloxane, or polymethylphenylsiloxane polymeric group.

4,960,836

POLYAMIDE POLYCARBONATE BLOCK COPOLYMER

James L. DeRudder, Mt. Vernon, Ind., assignor to General Electric Company, Mt. Vernon, Ind.

Filed Aug. 16, 1989, Ser. No. 394,689

Int. Cl.[5] C08G *69/44, 64/18;* C08L *69/00*

U.S. Cl. 525—423 28 Claims

1. A process for preparing block copolymers of polyamides and carbonate polymers which comprises the admixture of a polyamide with an carboxyl-functional carbonate polymer together with an effective linking amount of a polyepoxy compound selected from the group consisting of poly O- or N-epoxyalkyl-substituted cyclic amides, imides and imidates, this admixture being conducted under conditions such as to effect the reaction of said linking agent with said polyamide and said carbonate polymer.

4,960,837

POLYETHERIMIDES

Colin K. Alesbury, Hampshire, England, assignor to Pirelli General plc, London, United Kingdom

Filed Sep. 27, 1988, Ser. No. 249,858

Claims priority, application United Kingdom, Oct. 1, 1987, 8723048

Int. Cl.[5] C08F *283/04;* C08G *8/02*

U.S. Cl. 525—420 9 Claims

1. A graft polymer produced by grafting an amine or an acyl group onto the imide groups of a silicone polyimide or a polyetherimide.

4,960,838

BLEND OF POLYKETONE POLYMER WITH AN AMORPHOUS POLYAMIDE POLYMER

William P. Gergen, Houston, Tex., and William W. C. Hart, Avon, Conn., assignors to Shell Oil Company, Houston, Tex.

Filed Nov. 30, 1988, Ser. No. 278,098

Int. Cl.[5] C08L *77/06*

U.S. Cl. 525—426 22 Claims

1. A composition comprising a blend of (a) a linear alternating polymer consisting essentially of polymerized units of carbon monoxide and at least one ethylenically unsaturated hydrocarbon and (b) a wholly amorphous polyamide polymer.

4,960,839

METHOD OF MAKING A POLYCARBONATE CROSS-LINKED RESIN

Niles R. Rosenquist, Evansville, Ind., assignor to General Electric Company, Mt. Vernon, Ind.

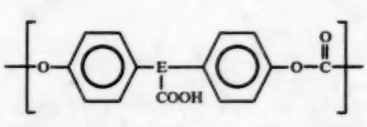
Division of Ser. No. 281,141, Dec. 7, 1988, abandoned. This application Sep. 28, 1989, Ser. No. 414,165

Int. Cl.[5] C08G *63/62*

U.S. Cl. 525—462 10 Claims

1. A method of cross-linking a resin having sites reactive with a carboxylic group, which comprises;

adding to the resin a polycarbonate resin, containing in the polymer chain at least one divalent moiety of the formula;



(I)

wherein E is selected from the group consisting of a trivalent hydrocarbon radical containing from 1 to 15 carbon atoms, inclusive, and a halogen-substituted hydrocarbon radical containing from 1 to 15 carbon atoms, inclusive.

4,960,840

EPOXIDISED MODIFIED ACETOPHENONE/FORMALDEHYDE RESINS

Jacques-Alain Cotting, Bonnefontaine, and Alfred Renner, Montelier, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Aug. 18, 1989, Ser. No. 396,410

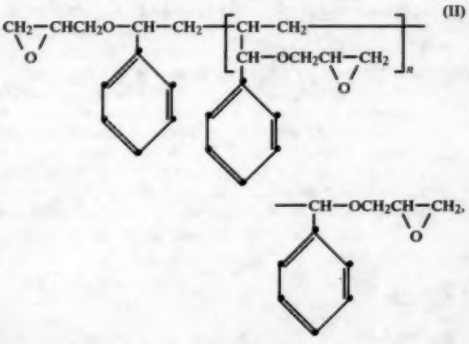
Claims priority, application Switzerland, Aug. 22, 1988, 3110/88

Int. Cl.[5] **C08G** *2/30, 16/04*

U.S. Cl. 525—521 **11 Claims**

1. A polyglycidyl ether which is obtained by reacting acetophenone with 0.7 to 1.4 mol of formaldehyde per mol of acetophenone, in the presence of an alkaline catalyst and in the temperature range from 50 to 100° C., to a carbonylated acetophenone/formaldehyde resin, hydrogenating said carbonylated resin to a modified hydroxylated acetophenone/formaldehyde resin, subsequently converting said resin with epichlorohydrin, in the presence of a phase transfer catalyst, into the corresponding polychlorohydrin ether, and dehydrochlorinating said ether with a base.

10. A polyglycidyl ether according to claim 1 of formula II



(II)

wherein n is an integer from 1 to 5.

4,960,841

POLYPHENYLENE SULFIDE/POLYPHENYLENE SULFIDE SULFONE BLOCK COPOLYMER

Jubeiji Kawabata, Takaishi; Manabu Chiba, Izumi-ohtsu; Toshinori Sugie, Takaishi; Fumihiro Kobata, Izumi; Hitoshi Izutsu, Osaka; Toshio Inoue, Osaka, and Takayuki Mine, Nara, all of Japan, assignors to Dainippon Ink and Chemicals, Inc., Tokyo, Japan

Continuation of Ser. No. 93,204, Sep. 4, 1987, abandoned. This application Dec. 30, 1988, Ser. No. 292,633

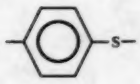
Claims priority, application Japan, Nov. 20, 1986, 61-277599; May 7, 1987, 62-109900; May 11, 1987, 62-112427

Int. Cl.[5] **C08G** *75/14*

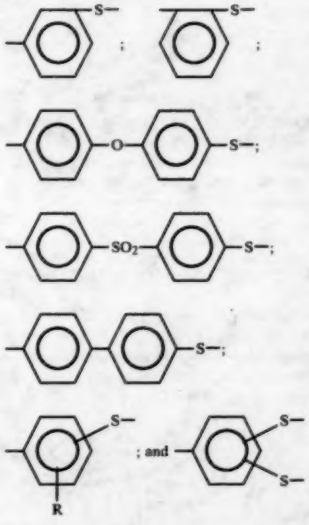
U.S. Cl. 525—537 **6 Claims**

1. A process for producing a block copolymer composed of polyphenylene sulfide segments and polyphenylene sulfide sulfone segments and having a logarithmic viscosity (η) of 0.03 to 1.0, said logarithmic viscosity (η) being determined at 206° C. for its solution in alpha-chloronaphthalene in a polymer concentration wherein said polyphenylene sulfide segments consist of at least 70 mole % of p-phenylene sulfide units and said polyphenylene sulfide sulfone segments consist of at least 90 mole % of phenylene sulfide sulfone segments, of 0.4 g/100 ml of solution and calculated in accordance with the equation (η)=ln (relative viscosity)/polymer concentration, which comprises reacting a polyphenylene sulfide prepolymer with a mixture of a dihalodiphenylsulfone and a sulfidization agent, or a polyphenylene sulfide sulfone prepolymer with a mixture of a polyhalogenated aromatic compound and a sulfidization agent, in a polar solvent select from the group consisting of N,N-dimethylformamide, N,N-dimethylacetamide, N-methyl-2-pyrrolidone, N-ethyl-2-pyrrolidone, N-methyl-epsilon-caprolactam, hexamethylphosphoramide and mixtures thereof

wherein said polyphenylene sulfide prepolymer consists essentially of at least 70 mole % of structural units represented by the formula

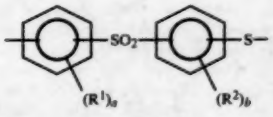


and not more than 30 mole % of structural units selected from the group consisting of



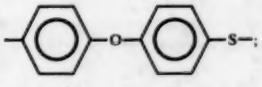
wherein R represents an alkyl group, a nitro group, a phenyl group, an alkoxy group, a carboxylic acid group or a metal carboxylate group, and

wherein said polyphenylene sulfide sulfone prepolymer consists essentially of at least 90 mole % of structural units represented by the formula



wherein groups bonded to both terminals of the polymer are ortho- or para- to the sulfone group, R^1 and R^2 represent hydrogen or a C_1–C_8 alkyl group /or an aryl group, and a and b are integers of 0 to 4,

and not more than 10 mole % of structural units selected from the group consisting of



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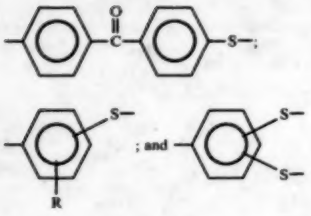


wherein R represents an alkyl group, a nitro group, a phenyl group, a carboxylic acid group or a metal carboxylate group.

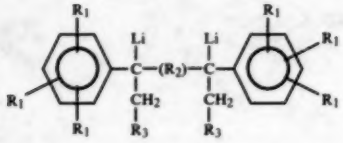
4,960,842

AMINE CONTAINING INITIATOR SYSTEM FOR ANIONIC POLYMERIZATION

Grace Y. Lo; Eric W. Otterbacher, both of Midland, Mich.; Massimo D. Bezoari, and Brian W. Walther, both of Baton Rouge, La., assignors to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 121,364, Nov. 16, 1987, abandoned. This application May 9, 1989, Ser. No. 352,670
Int. Cl.[5] C08F 2/38, 4/48; B01J 31/12
U.S. Cl. 526—175 17 Claims

1. A process for the polymerization of at least one anionically polymerizable monomer comprising contacting under anionic polymerization conditions the monomer with an initiator mixture comprising a multifunctional lithium containing compound corresponding to the formula:



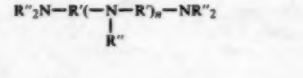
wherein:

R_1 is independently each occurrence hydrogen or an inert radical having from 0 to 16 carbon atoms;

R_2 is a divalent organic radical having at least 6 carbon atoms, R_2 having at least one aromatic ring and the aromatic ring being directly attached to a carbon which is attached to an aromatic ring of the above formula;

R_3 is selected from the group consisting of alkyl, cycloalkyl, aromatic, mixed alkyl/aromatic and mixed cycloalkyl-/aromatic radicals containing from 1 to 20 carbon atoms;

and an organic diamine or triamine corresponding to the formula:



(I)

wherein:

R' independently each occurrence is a C_{2-20} alkadiyl group or an inertly substituted derivative thereof;

R" independently each occurrence is a C_{1-20} alkyl group or an inertly substituted derivative thereof; and

n is zero or one.

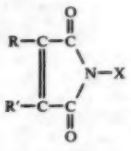
4,960,843

METHOD OF PRODUCING POLY(VINYL CHLORIDE)-BASED RESINS

Masahiko Yazawa; Hiroshi Kaneko, both of Yokkaichi, and Katsuo Takemoto, Aichi, all of Japan, assignors to Tosoh Corporation, Shin-nanyo, Japan

Filed Jul. 3, 1989, Ser. No. 374,909
Claims priority, application Japan, Jul. 5, 1988, 63-165878
Int. Cl.[5] C08F 22/40
U.S. Cl. 526—262 5 Claims

1. In the process of copolymerizing vinyl chloride with N-substituted maleimide of the formula:



(I)

wherein

X is a substituted or unsubstituted straight chain or cyclic, aliphatic or aromatic group having 1 to 30 carbon atoms, and R and R', which may be identical or different, are hydrogen atoms, fluorine, chlorine or bromine atoms, cyano groups or alkyl groups having not more than 3 carbon atoms; by emulsion polymerization in an aqueous medium in contact with a polymerization catalyst;

the improvement which comprises incorporating in said aqueous medium a liquid organic compound having a hydroxyl group in its molecule in an amount sufficient to maintain said emulsion, and recovering said copolymer having improved heat deformation resistance, shorter gelling time on molding, and improved coloration resistance.

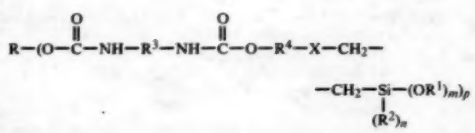
4,960,844

SILANE TERMINATED LIQUID POLYMERS

Hakam Singh, Bradbury, Calif., assignor to Products Research & Chemical Corporation, Glendale, Calif.

Filed Aug. 3, 1988, Ser. No. 227,733
Int. Cl.[5] C08G 77/06
U.S. Cl. 528—17 16 Claims

1. A liquid polymer which is rapidly curable, at room temperature, to a solid hydrolytically stable elastomer having high tensile and tear strengths, said liquid polymer having the formula:



wherein R is a liquid polymeric backbone selected from the group consisting of polyether and polythioether, said backbone having a number average molecular weight of at least 1,500 and having no carboxyl or hydroxyl groups; R^1 is lower alkyl, R^2 is lower alkyl, R^3 is a divalent organic radical having no sulfur atoms, R^4 is alkylene of from 3 to 6 carbon atoms, and which separates the oxygen atom from X by at least 3 carbon atoms, X is sulfur or —S—R^5—S— wherein R^5 is alkylene having from 2 to 12 carbon atoms, alkylene thioether of from 4 to 12 carbon atoms or hydrocarbon ether of from 4 to 20 carbon atoms, p is 2 to 4, m is 1 to 3, n is 0 to 2 and the sum of m and n is 3.

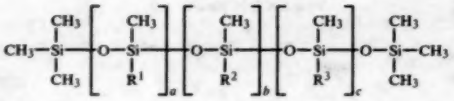
4,960,845

SULFATED SILICONE POLYMERS

Anthony J. O'Lenick, Jr., Lilburn, Ga., assignor to Siltech Inc., Norcross, Ga.

Filed Nov. 8, 1989, Ser. No. 433,155
Int. Cl.[5] C08G 77/04
U.S. Cl. 528—25 **5 Claims**

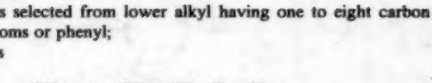
1. A sulfated silicone polymer compound which conforms to the following structure;



wherein

R^1 is selected from lower alkyl having one to eight carbon atoms or phenyl;

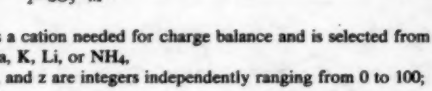
R^2 is



M is a cation needed for charge balance and is selected from Na, K, Li, or NH_4,

x, y, and z are integers independently ranging from 0 to 100;

R^3 is



a and c are independently integers ranging from 0 to 50;

b is an integer ranging from 1 to 50.

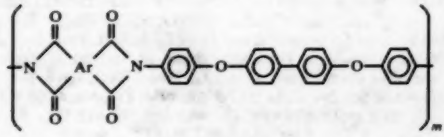
4,960,846

POLYIMIDE COPOLYMERS CONTAINING 4,4'-BIS(P-AMINOPHENOXY)BIPHENYL AND SILOXANE DIAMINE MOIETIES

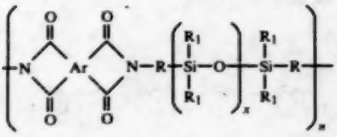
Marvin J. Burgess, Lisle; David A. Wargowski, Naperville, and Agnes M. Palka, St. Charles, all of Ill., assignors to Amoco Corporation, Chicago, Ill.

Filed Mar. 9, 1990, Ser. No. 491,436
Int. Cl.[5] C08G 77/04
U.S. Cl. 528—26 **10 Claims**

1. A polyimide composition comprising recurring units



and



wherein Ar is at least one tetravalent aromatic nucleus; R is a divalent hydrocarbon radical; R_1 is a monovalent hydrocarbon radical; m and n are each at least one; and x is 1 to about 50.

4,960,847

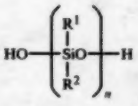
ROOM TEMPERATURE VULCANIZABLE ORGANOPOLYSILOXANE COMPOSITION

Masatoshi Arai, and Shinichi Satoh, both of Annaka, Japan, assignors to Shin-Etsu Chemical Co., Ltd., Japan

Filed Jul. 7, 1988, Ser. No. 216,163
Claims priority, application Japan, Jul. 8, 1987, 62-170373
Int. Cl.[5] C08G 77/20
U.S. Cl. 528—32 **13 Claims**

1. A room temperature vulcanizable organopolysiloxane composition, comprising the following first to third ingredients:

100 parts by weight of a diorganopolysiloxane blocked with a hydroxyl group at both ends of the molecule and having the formula



wherein R^1 and R^2 independently represent an alkyl group having from 1 to 8 carbon atoms, a cyclohexyl group, an alkenyl group or an aryl group with or without a halogen substituent and n is an integer such that the diorganopolysiloxane has a viscosity in the range of 25 to 500,000 centistokes at 25° C.;

from 0.5 to 30 parts by weight of an organosilane or siloxane having at least two hydrolyzable groups bonded to the silicon atom or atoms in one molecule; and

from 0.1 to 100 parts by weight of an organosilane or a branched organosiloxane obtained by co-hydrolysis of a monofunctional chlorosilane and a trifunctional or tetrafunctional silane, said organosilane or branched organosiloxane having at least one vinyl group and at least one hydroxyl group each bonded to a silicon atom in the molecule.

4,960,848

PROCESS FOR THE PRODUCTION OF POLYISOCYANATES CONTAINING ISOCYANURATE GROUPS AND THEIR USE

Hans J. Scholl, and Josef Pedain, both of Cologne, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Apr. 21, 1989, Ser. No. 341,348
Claims priority, application Fed. Rep. of Germany, Apr. 27, 1988, 3814167
Int. Cl.[5] C08G 18/16
U.S. Cl. 528—48 **11 Claims**

1. A process for the preparation of an isocyanurate polyisocyanate containing aliphatically and/or cycloaliphatically bound isocyanate groups which comprises trimerizing a portion of the isocyanate groups of an organic diisocyanate containing aliphatically and/or cycloaliphatically bound isocyanate groups in the presence of a quaternary ammonium fluoride catalyst and terminating the trimerization reaction at the desired degree of trimerization by the addition of a catalyst poison.

4,960,849

POLYURETHANE FROM A COPOLYETHER OF TETRAHYDROFURAN AND 3-ALKYL TETRAHYDROFURAN

Kazuaki Okabe, Kitasaitama; Hideyuki Ishii, Yokosuka; Haruo Watanabe, Tokyo, and Shuichi Takeuchi, Tokyo, all of Japan, assignors to Hodogaya Chemical Co., Ltd., Tokyo, Japan

Filed Mar. 24, 1988, Ser. No. 172,574
Claims priority, application Japan, Mar. 25, 1987, 62-68764
Int. Cl.[5] C08G 18/32
U.S. Cl. 528—76 14 Claims

1. A polyurethane resin composition which comprises a copolyether polyol liquid at room temperature having a primary hydroxyl group as a terminal group obtained by the copolymerization of tetrahydrofuran and a 3-alkyl tetrahydrofuran at a mixing molar ratio of 85/15–20/80, a polyisocyanate compound and an active hydrogen atom-containing compound reactive with isocyanate group.

4,960,850

PRODUCTION OF DIORGANOPOLYSILOXANES HAVING SILANOL END GROUPS

Lucien Billet, Vernaison, and Jean-Jacques Lebrun, Caluire, both of France, assignors to Rhone-Poulenc Chimie, Courbevoie, France

Filed Apr. 18, 1988, Ser. No. 182,462
Claims priority, application France, Apr. 16, 1987, 87 05645
Int. Cl.[5] C08G 77/06
U.S. Cl. 528—23 10 Claims

1. A process for the preparation of a polydiorganosiloxane having silanol end groups, comprising bulk polycondensing a polydiorganosiloxane oligomer having silanol end groups in a closed reaction zone in the presence of a catalytically effective amount of trifluoromethylsulfonic acid, at a temperature of from 20° to 160° C., while continuously removing water of polycondensation, and terminating the polycondensation reaction by adding a catalyst neutralizing amount of a cyclopolydiorganosilazane or a polydiorganosilazane having diorganoaminosilyl end groups to the medium of reaction, said cyclopolydiorganosilazane or polydiorganosilazane enabling the silanol end groups of the polydiorganosiloxane formed to be preserved intact.

4,960,851

CRYSTALLINE AROMATIC POLYETHERSULPHONES HAVING TERPHENYLENE LINKAGES

Philip A. Staniland, Middlesbrough, England, assignor to Imperial Chemical Industries PLC, London, Great Britain

Filed Feb. 27, 1989, Ser. No. 315,738
Claims priority, application United Kingdom, Mar. 1, 1988, 8804861
Int. Cl.[5] C08G 61/12
U.S. Cl. 528—125 10 Claims

1. A melt crystallizable thermoplastic polyethersulphone comprising repeating units I either alone or together with repeating units II and optionally together with up to 20 mole % of other repeating units, said units being connected by ether linkages, units I and II being of formulae:

$$PhSO_2Ph_3SO_2Ph \qquad I$$

$$Ph_n \qquad II$$

respectively, wherein:
Ph is 1,4-phenylene; and
n is an integer 1 or 2;
said other repeating units comprising divalent aromatic units containing activating groups selected from —CO— and —SO_2—.

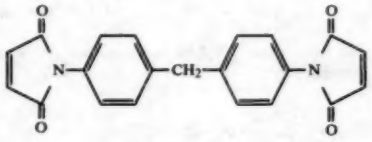
4,960,852

THERMOSETTING RESIN COMPOSTION FROM BIS, MALEIMIDE AND BIS (META-AMINO PHENOXY) COMPOUND

Norimasa Yamaya; Nobuhito Koga; Masahiro Ohta, all of Yokohama, and Akihiro Yamaguchi, Kamakura, all of Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan

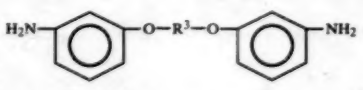
Division of Ser. No. 71,161, Jul. 8, 1987, Pat. No. 4,831,102.
This application Feb. 1, 1989, Ser. No. 304,558
Claims priority, application Japan, Jul. 15, 1986, 61-164668; Aug. 15, 1986, 61-190563; Aug. 15, 1986, 61-190564
Int. Cl.[5] C08G 73/10
U.S. Cl. 528—170 3 Claims

1. A thermosetting resin composition which comprises:
(a) a bismaleimide derivative having the formula (III):



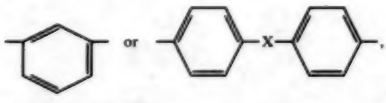
(III)

(b) a diamine derivative having the formula (IV):



(IV)

wherein R^3 is a divalent radical represented by



wherein X is a bond, or X is a radical selected from the group consisting of a hexafluorinated isopropylidene radical, a carbonyl radical, a thio radical, and a sulfinyl radical.

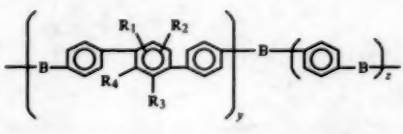
4,960,853

RIGID ROD AROMATIC BENZOXAZOLE/THIAZOLE HETEROCYCLIC COPOLYMERS

Fred E. Arnold, Centerville, and Jerry L. Burkett, Troy, both of Ohio, assignors to The United States of America as Represented by the Secretary of the Air Force, Washington, D.C.

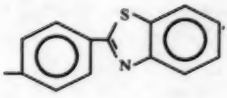
Division of Ser. No. 227,979, Jul. 29, 1988, Pat. No. 4,900,806.
This application Oct. 23, 1989, Ser. No. 411,777
Int. Cl.[5] C08G 75/32
U.S. Cl. 528—183 11 Claims

1. An aromatic heterocyclic copolymer having repeating units of the formula



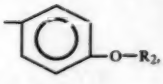
wherein R_1 is —H or

R_2 is

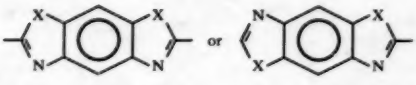


R_3 is

and R_4 is R_2 or



and B is



wherein X is —O—; and wherein y ranges from about 0.02 0.20 and z is 1.0-y.

4,960,854

RIGID ROD AROMATIC BENZTHIAZOLE/OXAZOLE HETEROCYCLIC POLYMER

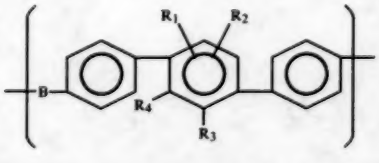
Fred E. Arnold, Centerville, and Jerry L. Burkett, Troy, both of Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Division of Ser. No. 227,977, Jul. 29, 1988, Pat. No. 4,900,805. This application Sep. 25, 1989, Ser. No. 411,769

Int. Cl.[5] C08G *75/32*

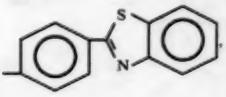
U.S. Cl. 528—183 **11 Claims**

1. An aromatic heterocyclic polymer having repeating units of the formula



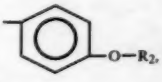
wherein R_1 is —H or

R_2 is

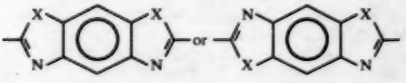


R_3 is

and R_4 is R_2 or



and B is



wherein X is —O—.

4,960,855

POLYARYLENE ETHER CONTAINING BENZOXAZOLE GROUPS AND A PROCESS FOR THEIR PREPARATION

Burkhard Köhler, and Rolf-Volker Meyer, both of Krefeld, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

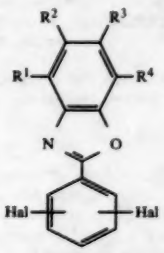
Filed May 22, 1989, Ser. No. 354,810

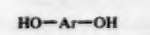
Claims priority, application Fed. Rep. of Germany, Jun. 2, 1988, 3818763

Int. Cl.[5] C08G *65/40*

U.S. Cl. 528—211 **9 Claims**

1. Polyarylene ether containing benzoxazole groups, prepared by the reaction of monomer units corresponding to formula (I) and monomer units corresponding to formula (II)

 (I)

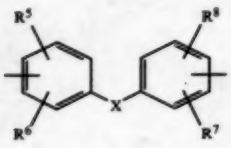
 (II)

wherein

R^1, R^2, R^3 and R^4 denote, independently of one another, hydrogen, C_1 to C_{20} alkyl, C_6 to C_{14} alkaryl or arylalkyl and at most one of R^1 to R^4 is Hal and any two of R^1 to R^4 when in the ortho position to one another additionally together denote a ring containing at most 12 carbon atoms,

Hal denotes fluoro, chloro, bromo or iodo in the 2,4- or 2,6-positions of the phenyl ring and

Ar denotes m-phenylene, p-phenylene, naphthylene or a moiety corresponding to formula III



(III)

wherein

X is a chemical bond or X denotes an oxygen atom, a sulphur atom, a sulphone group or C_1 to C_{20} alkylene, and

R^5 to R^8 denote, independently of one another, hydrogen, C_1 to C_{20} alkyl, C_6 to C_{14} aryl or a halogen atom.

4,960,856

UREA-FORMALDEHYDE COMPOSITIONS AND METHOD OF MANUFACTURE

Richard Formaini, Stone Mountain, Ga., assignor to Georgia-Pacific Corporation, Atlanta, Ga.

Filed Nov. 28, 1988, Ser. No. 276,750

Int. Cl.[5] C08G *12/40*

U.S. Cl. 528—256 **14 Claims**

1. A method for manufacturing an aqueous solution of water-soluble urea-formaldehyde precondensate comprising:

(a) reacting urea and formaldehyde at a temperature between about 65° and 90° C. in the presence of acid catalyst in aqueous solution having a pH between about 3.5 and 4.25;

(b) increasing the pH of the solution to between about 7.0 and 8.0 and adjusting the temperature to between about 40° and 70° C.; and

(c) maintaining the conditions of step (b) and continuing to react urea and formaldehyde for a time sufficient to produce said aqueous precondensate solution.

4,960,857

POLYKETONE POLYMER FROM CARBON MONOXIDE AND BICYCLO CARBOXYLIC ACID COMPOUND

Eit Drent, Amsterdam, Netherlands, assignor to Shell Oil Company, Houston, Tex.

Filed Jul. 14, 1989, Ser. No. 379,839

Claims priority, application Netherlands, Jul. 15, 1988, 8801804

Int. Cl.[5] C08G *67/02*

U.S. Cl. 528—271 **8 Claims**

1. A linear alternating copolymer of carbon monoxide and an unsaturated bicyclic carboxylic acid compound of up to 10 carbon atoms and two rings, at least one of which is six membered with the 1 and 4 carbon atoms connected by oxygen or methylene, the 5 and 6 atoms connected by a double bond and having an oxycarbonyl substituent on at least on of the 2 and 3 carbon atoms, polymerized through the unsaturation.

4,960,858

RIGID ROD AROMATIC BENZIMIDAZOLE/THIAZOLE HETEROCYCLIC POLYMER

Fred E. Arnold, Centerville, and Jerry L. Burkett, Troy, both of Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

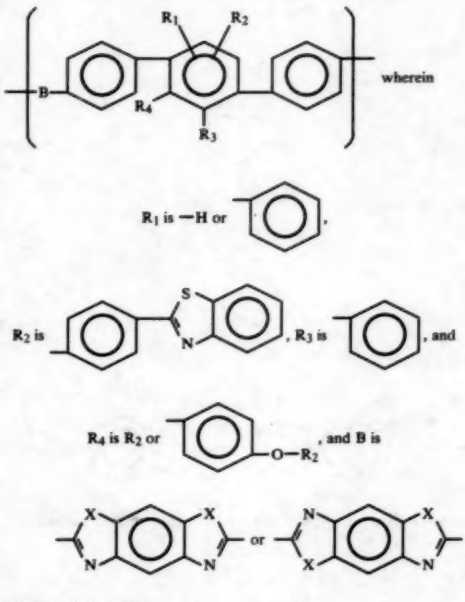
Division of Ser. No. 227,977, Jul. 29, 1988, Pat. No. 4,900,805.

This application Sep. 25, 1989, Ser. No. 411,756

Int. Cl.[5] C08G *75/32*

U.S. Cl. 528—337 **6 Claims**

1. An aromatic heterocyclic polymer having repeating units of the formula



wherein

R_1 is —H or ,

R_2 is , R_3 is , and

R_4 is R_2 or , and B is

wherein X is —NH—.

4,960,859

RIGID ROD AROMATIC BENZIMIDAZOLE/THIAZOLE HETEROCYCLIC COPOLYMER

Fred E. Arnold, Centerville, and Jerry L. Burkett, Troy, both of Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

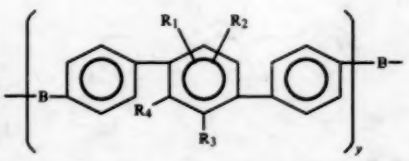
Division of Ser. No. 227,979, Jul. 29, 1988, Pat. No. 4,900,806.

This application Oct. 25, 1989, Ser. No. 411,755

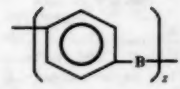
Int. Cl.[5] C08G *73/18*

U.S. Cl. 528—342 **6 Claims**

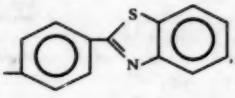
1. An aromatic heterocyclic copolymer having repeating units of the formula



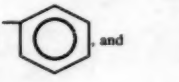
-continued



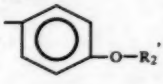
wherein R_1 is —H or ,



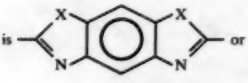
R_2 is ,



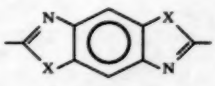
R_3 is , and



R_4 is R_2 or ,



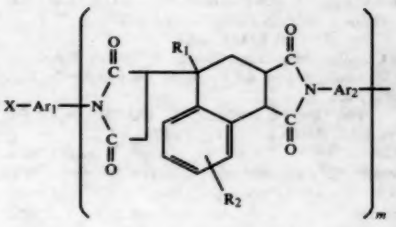
and B is or

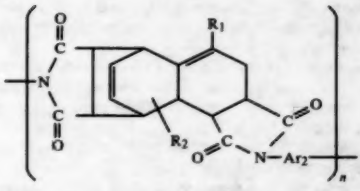


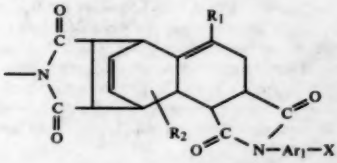
wherein X is —NH—;

and wherein y ranges from about 0.02 to 0.20 and z is 1.0—y.

(I)







wherein X represents an —NH_2 group and/or —OH group, Ar_1 and Ar_2 independently represent an aromatic residue, R_1 represents a hydrogen atom or an alkyl group having from 1 to 10 carbon atoms, R_2 represents a hydrogen atom, an alkyl or alkoxy group having from 1 to 20 carbon atoms or hydroxyl group, and each of m and n represents a number of from 0 to 30.

4,960,860

IMIDE COMPOUND AND COMPOSITION CONTAINING THE SAME

Yasuhisa Saito, Higashiosaka; Kunimasa Kamio, Suita; Mitsuhiro Shibata, Yao; Katsuya Watanabe, Takatsuki; Yutaka Shiomi, Hirakata, and Youichi Ueda, Kashihara, all of Japan, assignors to Sumitomo Chemical Co., Ltd., Osaka, Japan

Division of Ser. No. 138,084, Dec. 28, 1987, Pat. No. 4,888,407. This application May 31, 1989, Ser. No. 359,722

Claims priority, application Japan, Dec. 26, 1986, 61-314259; Dec. 26, 1986, 61-314260; Jun. 23, 1987, 62-157329; Jun. 23, 1987, 62-157330; Jun. 23, 1987, 62-157331

The portion of the term of this patent subsequent to Oct. 3, 2006, has been disclaimed.

Int. Cl.[5] C08G *73/10*

U.S. Cl. 528—353 **4 Claims**

1. An imide compound represented by the general formula (I),

4,960,861

MULTI LAYER PROCESS FOR PRODUCING ARYLENE SULFIDE POLYMERS

Kohichi Kotera, Izumi-ohtsu; Toshinori Sugie, Takaishi; Fumihiro Kobata, Izumi; Juheiji Kawabata, and Sugio Hasegawa, both of Sakai, all of Japan, assignors to Dainippon Ink and Chemicals, Inc., Tokyo, Japan

Continuation of Ser. No. 760,093, Jul. 29, 1985, abandoned. This application Jun. 27, 1988, Ser. No. 213,436

Claims priority, application Japan, Jul. 31, 1984, 59-160936; Sep. 25, 1984, 59-198566

Int. Cl.[5] C08G *75/16*

U.S. Cl. 528—388 **8 Claims**

1. A process for producing a high-molecular-weight arylene sulfide polymer, which comprises reacting within a reaction vessel a polyhaloaromatic compound and a sulfidizing agent in a polar amide solvent in the presence of at least one polymerization additive to form a resin containing liquid composition consisting of a layer (I) containing a major amount of a polymer having a relatively high molecular weight and a minor amount of a polymer having a relatively low molecular weight and a layer (II) containing a major amount of a polymer having a relatively low molecular weight and a minor amount of a polymer having a relatively high molecular weight, withdrawing 30 to 70% by weight of the resin containing liquid composition from the top of the reaction vessel, and thereafter reacting the withdrawn resin after adding thereto a polyhaloaromatic compound and a sulfidizing agent and, as required, a polar amide solvent and a polymerization additive.

4,960,862

REGENERATION OF METALLO-ORGANIC CATALYST FOR CARBON DIOXIDE-EPOXIDE COPOLYMERIZATION

W. Eamon Carroll, Orefield, and Stephen A. Motika, Kutztown, both of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Mar. 31, 1989, Ser. No. 331,461
Int. Cl.[5] C08G 63/62; B01J 21/20, 21/02
U.S. Cl. 528—405 14 Claims

12. A process for copolymerizing carbon dioxide and epoxide with solid catalyst formed from a dicarboxylic acid and a polyvalent metal oxide, hydroxide, alkoxide or organic acid salt, comprising

(a) contacting said carbon dioxide and epoxide with said catalyst under copolymerization conditions in a reaction zone;

(b) removing at least a portion of said catalyst from said reaction zone, the catalyst thus removed having an activity less than freshly formed catalyst prior to said contacting step;

(c) separating the removed catalyst from any accompanying reaction zone materials;

(d) contacting said removed catalyst with a regenerating amount of dicarboxylic acid of the type used to form said catalyst originally, in a non-deleterious liquid medium and under regenerating conditions of time and temperature;

(e) separating contacted catalyst of step (d) from excess dicarboxylic acid to form a regenerated catalyst; and

(f) contacting said regenerated catalyst with carbon dioxide and epoxide under copolymerization conditions.

4,960,863

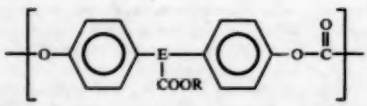
POLYCARBONATE CROSS-LINKED RESIN

Niles R. Rosenquist, Evansville, Ind., assignor to General Electric Company, Mt. Vernon, Ind.

Division of Ser. No. 281,141, Dec. 7, 1988, abandoned. This application Sep. 28, 1989, Ser. No. 414,164
Int. Cl.[5] C08G 63/62; C08F 6/00
U.S. Cl. 528—480 7 Claims

1. A cross-linked polycarbonate resin composition prepared by a process which comprises the thermolytic degradation of the polycarbonate resin containing at least one chain moiety of the formula:

(II)



wherein E is selected from the group consisting of a trivalent hydrocarbon radical containing from 1 to 15 carbon atoms, inclusive, and a halogen-substituted hydrocarbon radical containing from 1 to 15 carbon atoms, inclusive,; and R is selected from the group consisting of hydrocarbyl and halogen-substituted hydrocarbyl amenable to beta-elimination upon thermal degradation.

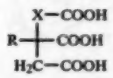
4,960,864

PROCESS FOR RECOVERING THERMOPLASTIC POLYMERS FROM DISPERSION

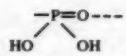
Christian Lindner, Cologne; Claus Wulff, Krefeld, and Karl-Heinz Ott, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 12,601, Feb. 9, 1987, abandoned. This applicatioa May 30, 1989, Ser. No. 358,954
Claims priority, application Fed. Rep. of Germany, Feb. 22, 1986, 3605798
Int. Cl.[5] C08F 6/16, 6/24
U.S. Cl. 528—486 7 Claims

1. In an improved process for recovering a thermoplastic polymer from its dispersion by coagulation and subsequently washing coagulate so obtained, the improvement comprises contacting the thermoplastic polymer in the coagulation step, in the washing step, or in both steps with at least one tricarboxylic acid of the formula



wherein X is a single bond, —CH_2—or —C_2H_4— and R is —H, —OH or



4,960,865

WATER WASH OF OLEFIN/CARBON MONOXIDE POLYMER

George C. Blytas; Zaida Diaz, both of Houston, Tex., and William W. C. Hart, Avon, Conn., assignors to Shell Oil Company, Houston, Tex.

Filed Sep. 25, 1989, Ser. No. 411,958
Int. Cl.[5] C08G 67/02
U.S. Cl. 528—499 7 Claims

1. A process for working up a linear alternating polymer of carbon monoxide and at least one ethylenically unsaturated hydrocarbon, which process comprises a) washing the polymer with water at a temperature of between about 80° C. and about 180° C. in a liquid water to solid polymer weight ratio of between about 0.5 and about 10, b) separating the polymer from the water, and c) drying the polymer.

4,960,866

CATALYST-FREE RESORBABLE HOMOPOLYMERS AND COPOLYMERS

Dieter Bendix, and Gunther Entenmann, both of Ingelheim am Rhein, Fed. Rep. of Germany, assignors to Boehringer Ingelheim Zentrale, Ingelheim am Rhein, Fed. Rep. of Germany

Continuation of Ser. No. 128,855, Dec. 4, 1987, abandoned. This application Jan. 24, 1989, Ser. No. 301,200
Claims priority, application Fed. Rep. of Germany, Dec. 6, 1986, 3641692
Int. Cl.[5] C08G 63/74
U.S. Cl. 528—499 3 Claims

1. A process for producing catalyst-free resorbable homopolymers or copolymers comprising the steps of: (a) dissolving a catalyst-containing polymer in an organic solvent which is immiscible with water, (b) bringing the thus dissolved polymer into intimate contact with water or with an aqueous phase which contains an inorganic acid, a water-soluble organic acid or a water-soluble complexing agent, (c) separating the organic phase from the aqueous phase, and (d) isolating the polymer from the organic phase.

4,960,867

LEIURUS QUINQUESTRIATUS VENOM PEPTIDE INHIBITOR OF CALCIUM ACTIVATED POTASSIUM CHANNELS

Maria Garcia, Edison, and Guillermo Gimenez-Gallego, Jersey City, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation of Ser. No. 103,323, Oct. 1, 1987, abandoned. This application Dec. 29, 1989, Ser. No. 462,898

Int. Cl.[5] **C07K** *7/10*

U.S. Cl. 530—324 **1 Claim**

1. A composition for assessing the contribution of high conductance Ca^{2+}-activated K^+ channels in smooth muscle comprising a purified peptide of the formula:

PYQ-F-T-N-V-S-T-T-S-K-E-C-W-S-V-C-Q-R-L-H-N-T-S-R-G-K-C-M-N-K-K-C-R-C-Y-S.

4,960,868

METHOD OF CLEAVAGE AT METHIONINE OF POLYPEPTIDES

Umberto Canosi; Gabriele De Fazio, and Stefano Villa, all of Rome, Italy, assignors to Istituto di Ricerca Cesare Serono SpA, Ardea, Italy

Filed Feb. 13, 1989, Ser. No. 310,426

Claims priority, application Italy, Feb. 17, 1988, 47643 A/88

Int. Cl.[5] **C07K** *1/12, 3/10*

U.S. Cl. 530—389 **11 Claims**

1. In a method for the cleavage of a polypeptide at methionine which comprises reacting said polypeptide with cyanogen bromide, the improvement wherein said reaction is conducted in a solution of guanidine hydrochloride and hydrochloric acid.

4,960,869

URANIUM ALLYLIC COMPLEX

James C. Stevens, and William A. Fordyce, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 90,268, Aug. 27, 1987, Pat. No. 4,855,523. This application Aug. 1, 1988, Ser. No. 226,720

Int. Cl.[5] **C07F** *5/00*

U.S. Cl. 534—11 **17 Claims**

1. A complex of the formula:

$U(Cp^*)_2(X)Q$

wherein X is chloro or bromo and Cp^* is a poly-substituted cyclopentadienyl ligand, and Q is an allylic moiety.

4,960,870

HEAVY METAL COMPLEX AZO DYES CONTAINING A BENZOTHIOPHENE-1,1-DIOXIDE, 2,1-BENZOTHIAZINE-2,2-DIOXIDE, 1,4-BENZOTHIAZINE-1,1-DIOXIDE OR THIENOPYRIDINE-1,1-DIOXIDE COUPLING COMPONENT

Urs Lehmann, Basle, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

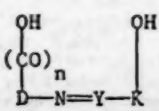
Filed Feb. 1, 1988, Ser. No. 150,597

Claims priority, application Switzerland, Feb. 11, 1987, 496/87

Int. Cl.[5] **C09B** *45/06, 45/16;* **D06P** *1/10, 3/32*

U.S. Cl. 534—619 **17 Claims**

A heavy metal complex of an azo or azomethine dye of the formula



in which D—$(CO)_n$—OH is an aminophenol, aminonaphthol or aminobenzoic acid diazo component, which, in addition to the metallizable group, is unsubstituted or substituted by C_1–C_8-alkyl, C_1–C_8-alkoxy, C_2–C_8-alkanoylamino, C_2–C_8-alkoxycarbonylamino, benzoylamino, amino, mono- or dialkylamino having 1 to 8 carbon atoms in the alkyl radical, phenylamino, alkoxycarbonyl having 1 to 8 carbon atoms in the alkoxy radical, nitro, cyano, trifluoromethyl, halogen, sulfamoyl, sulfamoyl which is monosubstituted or disubstituted on the nitrogen atom by C_1–C_4-alkyl, C_1–C_4-alkoxy-C_1–C_4-alkyl, hydroxy-C_1–C_4-alkyl, C_5–C_7-cycloalkyl or phenyl, carbamoyl, ureido, hydroxyl, C_1–C_8-alkylsulfonyl, phenylsulfonyl, carboxyl, sulfomethyl, sulfo, phenylazo, naphthylazo or a fibre-reactive acryloyl, mono-, di-, or trihaloacryloyl or -methacryloyl, mono- or dihalopropionyl, phenylsulfonyl-propionyl, vinylsulfonylpropionyl, β-chloroethylsulfonylpropionyl, methylsulfonylpropionyl or β-sulfatoethylsulfonyl, mono-, di- or tri- halopyrimidyl or mono- or dihalotriazinyl radical, which is bonded directly or via —NH—, —$N(CH_3)$—, —$N(CH_2H_5)$—, —$N(C_3H_7)$—,

4,960,871

FIBER-REACTIVE HALOTRIAZINE PYRIDINE-BASED MONOAZO COLORANT

Toshio Hihara, and Yukiharu Shimizu, both of Kitakyushu, Japan, assignors to Mitsubishi Chemical Industries Inc., Japan

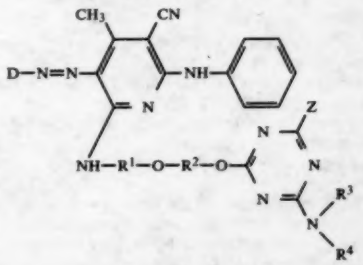
Continuation of Ser. No. 38,543, Apr. 15, 1987, abandoned. This application Feb. 17, 1989, Ser. No. 313,316

Claims priority, application Japan, Apr. 17, 1986, 61-87141

Int. Cl.[5] **C09B** *62/04, 62/005;* **D06P** *1/382, 3/66*

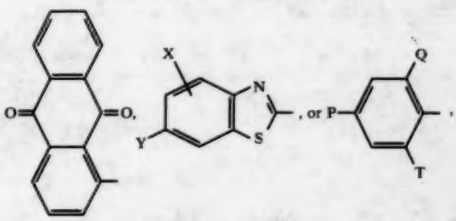
U.S. Cl. 534—635 **9 Claims**

1. A monoazo colorant represented by the formula



wherein:

D represents



wherein X represents hydrogen or halogen, and Y represents nitro, lower alkylsulfonyl, thiocyanato, or halogen, P represents nitro or lower alkylsulfonyl, and Q and T each represents hydrogen, halogen, or cyano;

R^1 and R^2 each independently represents ethylene or propylene;

R^3 and R^4 each independently represents hydrogen, alkyl, or alkyl substituted by lower alkoxy or lower alkoxy alkoxy, and

Z represents halogen.

9. A method of dyeing polyester and cellulose mixed fibers using the monoazo colorant of claim 1.

4,960,872

WATER-SOLUBLE MONOAZOPYRAZOLONE DYESTUFFS HAVING FIBER REACTIVE GROUPS OF THE VINYLSULFONE SERIES

Ludwig Schläfer, Kelkheim; Günther Schwaiger, Frankfurt, and Werner H. Russ, Hofheim am Taunus, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

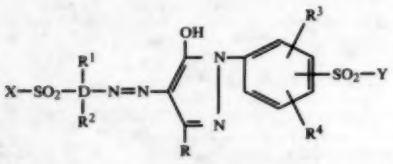
Filed Feb. 3, 1988, Ser. No. 151,720

Claims priority, application Fed. Rep. of Germany, Feb. 6, 1987, 3703565

Int. Cl.[5] C09B 62/51; D06P 1/384, 3/66, 3/24

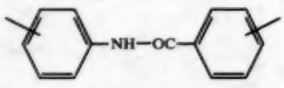
U.S. Cl. 534—642 15 Claims

1. A water-soluble monoazo compound of the formula



in which:

D is a benzene ring or a group of the formula



R^1 is hydrogen, methyl, ethyl, methoxy, ethoxy, chlorine, bromine, carboxy or sulfo,

R^2 is hydrogen, methyl, ethyl, methoxy, ethoxy, chlorine or bromine,

R^3 is hydrogen, methyl, ethyl, methoxy, ethoxy, chlorine, bromine, carboxy or sulfo, and

R^4 is hydrogen, methyl, ethyl, methoxy, ethoxy, chlorine or bromine,

it being possible for R^1, R^2, R^3 and R^4 to have meanings identical with one another or different from one another;

R is carboxy or carboalkoxy having 2 to 5 carbon atoms;

X is β-thiosulfatoethyl or β-sulfatoethyl, or

X is vinyl, and in that case R^1 or R^2 or both represent each sulfo, and

Y is β-thiosulfatoethyl or β-sulfatoethyl, or

Y is vinyl, and in that case R^1 or R^2 or both represent each sulfo,

and the two groups $-SO_2-X$ and $-SO_2-Y$ have meanings identical with or different from one another.

4,960,873

3-PYRIDYLISOTHIAZOLEAZO COMPOUNDS USEFUL AS DISPERSE DYES

Guenter Hansen, Ludwigshafen; Gunther Lamm, Hassloch; Helmut Reichelt, Neustadt, and Ernst Schefczik, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

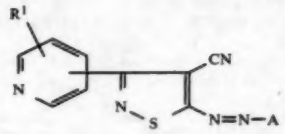
Filed Mar. 9, 1989, Ser. No. 320,964

Claims priority, application Fed. Rep. of Germany, Mar. 29, 1988, 3810643

Int. Cl.[5] C09B 29/039, 29/09, 29/36, 29/42; D06P 1/18

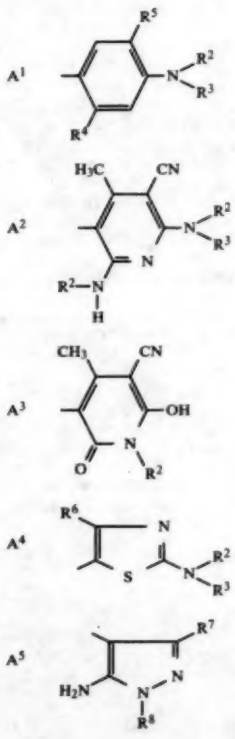
U.S. Cl. 534—765 4 Claims

1. An isothiazoleazo dye of the formula:



I

wherein R^1 is hydrogen, halogen, C_1–C_4-alkyl or C_1–C_4-alkoxy and A is a member selected from the group consisting of:



and

wherein R^2 and R^3 are each hydrogen; C_1–C_{12}-alkyl; C_1–C_{12}-alkyl the chain of which is interrupted by one or two oxygen atoms; said C_1–C_{12}-alkyl or said C_1–C_{12}-alkyl interrupted by one or two oxygen atoms carrying one or two substituents selected from the group consisting of cyano, hydroxyl, C_1–C_4-alkanoyloxy, benzoyloxy, phenoxy, C_1–C_8-alkoxycarbonyl and C_1–C_8-alkoxycarbonyl whose alkyl chain is interrupted by one or two oxygen atoms; C_3–C_5-alkenyl; C_5–C_7-cycloalkyl; phenyl or phenyl monosubstituted or disubstituted by chlorine, methyl, methoxy, dimethylamino or acetylamino; R^4 is hydrogen, C_1–C_4-alkyl, C_1–C_4-alkoxy, chlorine, C_1–C_4-alkanoylamino, C_1–C_4-alkanoylamino substituted by C_1–C_4-alkoxy, phenoxy or chlorine, ureido, C_1–C_4-mono- or dialkylureido or C_1–C_4-alkylsulfonylamino; R^5 is hydrogen, C_1–C_4-alkyl, C_1–C_4-alkoxy or chlorine; R^6 is hydrogen, C_1–C_9-alkyl, phenyl, furyl, thienyl, pyridyl, or phenyl, furyl, thienyl or pyridyl each of which is substituted by one or two methyl, methoxy, acetylamino, dimethylamino, or chlorine groups or combinations thereof; R^7 is hydrogen, C_1–C_4-alkyl or phenyl; and R^8 is hydrogen, C_1–C_6-alkyl, C_1–C_6-alkyl monosubstituted

or disubstituted by phenyl, furyl or thienyl; C_5–C_7-cycloalkyl or phenyl.

4,960,874

ISOTHIAZOLYLAZO DYES HAVING AMINOPHENYL AND AMINONAPHTHYL COMPONENTS

Udo Bergmann, Darmstadt; Johannes D. Dix, Neubofen; Guenter Hansen; Ernst Schefczik, both of Ludwigshafen, and Guenther Seybold, Neubofen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Continuation of Ser. No. 460,793, Jan. 25, 1983, Pat. No. 4,764,600. This application Jul. 1, 1988, Ser. No. 214,502

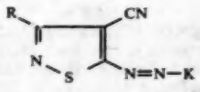
Claims priority, application Fed. Rep. of Germany, Feb. 16, 1982, 3205435

The portion of the term of this patent subsequent to Aug. 16, 2005, has been disclaimed.

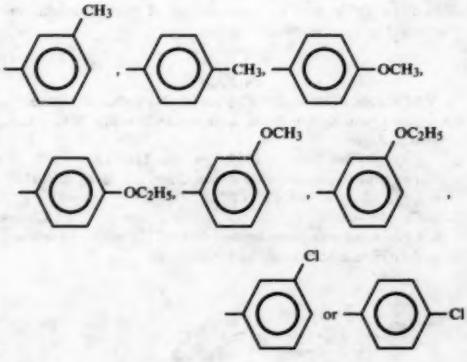
Int. Cl.[5] **C09B** *29/042, 29/09, 29/095;* **D06P** *3/54*

U.S. Cl. 534—791 **5 Claims**

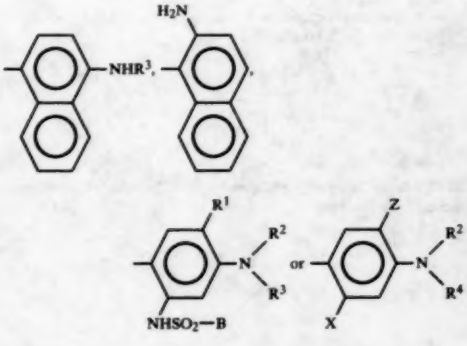
1. An isothiazolylazo dye of the formula:



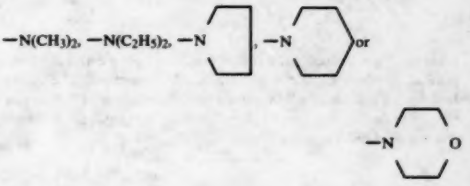
wherein R is alkyl or unsubstituted aryl radical or a substituted aryl radical of the formula:



and K is a radical of the formula:

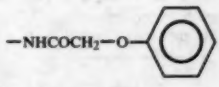


wherein B is C_1–C_4 alkyl or a substituted amino radical selected from the group consisting of:



where R^1 is hydrogen, methyl, methoxy or ethoxy, R^2 and R^3 independently of one another are each unsubstituted C_1–C_4 alkyl or substituted alkyl groups selected from the group consisting of C_1–C_4 alkyls which are substituted by chlorine, bromine, cyano, hydroxyl, C_1–C_4 alkoxy, benzyloxy, phenoxy, phenyl, C_1–C_4-alkylcarbonyloxy which is unsubstituted or further substituted by C_1–C_4 alkoxy, phenoxy or phenyl, or phenylcarbonyloxy which is unsubstituted or substituted by chlorine, bromine, methoxy, ethoxy, methyl or ethyl, oxycarbonyl, C_1–C_4 alkoxycarbonyl, C_1–C_4 alkoxycarbonyloxy, carbamyl, phenylalkoxycarbonyloxy, phenoxyalkyloxycarbonyloxy, C_1–C_4 alkoxyalkoxycarbonyloxy, phenylaminocarbonyloxy which is unsubstituted or substituted by chlorine, methoxy or methyl, C_1–C_4 alkoxyalkoxycarbonyl, phenylalkyloxycarbonyl or C_1–C_4 alkylaminocarbonyloxy which is unsubstituted or substituted by C_1–C_4 alkyl, C_1–C_4 alkoxy, chlorine or bromine; or R^3 is hydrogen, R^4 is a radical of the formula —A—OCO—Y—R, Z is hydrogen or methyl, X is hydrogen, methyl or methoxy or an acylamino radical selected from the group consisting of:

—NHCHO, —NHCOCH$_3$, —NHCOC$_2$H$_5$, —NHCO-aryl, —NHCOCH$_2$-aryl or



or —COCH$_2$—O—CH$_3$,

A is C_2- or C_3-alkylene and Y is —O— or —NH—.

4,960,875

EXTERNAL AGENT FOR THE SKIN COMPRISING A SPECIFIC ETHYLENIC COPOLYMER

Tatsuo Kinoshita, Shuto; Shuji Minami, Otake, and Shigeru Kanzaki, Sayama, all of Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

Continuation of Ser. No. 127,116, Dec. 1, 1987, abandoned. This application Aug. 1, 1989, Ser. No. 390,504

Claims priority, application Japan, Dec. 1, 1986, 61-284259

Int. Cl.[5] **C10L** *1/16*

U.S. Cl. 585—10 **6 Claims**

1. An external agent for application to the skin comprising a liquid low-molecular-weight ethylenic copolymer having (i) an ethylene content of 30 to 70 mole % and α-olefinic content of 70 to 30 mole %, (ii) a number average molecular weight (Mn) of 200 to 4500, (iii) a Q value (ratio of the weight average molecular weight to the number average molecular weight) of not more than 4, (iv) a standard deviation value (σ) of the ethylene content of the ethylenic copolymer of not more than 3, (v) an absorbance (A value) at the maximum absorption wavelength between 250 and 280 nm of not more than 0.1, said absorbance being measured with a 10 mm cell at a concentration of 5% by weight of the ethylenic copolymer in n-hexane, and (vi) a B value of 0.1 to 1.5, said value being defined by the following formula (I):

$$B = \frac{P_{OE}}{2P_O \cdot P_E} \quad \text{(I)}$$

wherein P_E represents the molar fraction of the ethylene component content of the copolymer, P_O represents the molar fraction of the alpha-olefin component content, and P_{OE} represents the molar fraction of the alpha-olefin/ethylene chains in the entire dyad chains.

4,960,876

MODIFIED GALACTOMANNANS AND PROCESS FOR THEIR PREPARATION

Giuseppe Molteni; Carlo Nicora, both of Varese; Attilio Cesaro, and Sabrina Pricl, both of Trieste, all of Italy, assignors to Fratelli Lamberti S.p.A., Italy

Filed Dec. 22, 1988, Ser. No. 288,233

Claims priority, application Italy, Dec. 29, 1987, 23244 A/87

Int. Cl.[5] C07G *17/00*; C08B *37/00*; C07H *15/00*

U.S. Cl. 536—114 **10 Claims**

1. Modified galactomannans having a total molar substitution exceeding 0.7 and containing an average of between 0.7 and 4 hydrophilic substituents and between 0.0001 and 0.02 hydrophobic substituents per anhydroglycosidic unit, the molar ratio of said hydrophilic to said hydrophobic substituents being between 35:1 and 40,000:1.

5. A process for preparing modified galactomannans having a total molar substitution exceeding 0.7 and containing an average of between 0.7 and 4 hydrophilic substituents and between 0.0001 and 0.02 hydrophobic substituents per anhydroglycosidic unit, comprising two stages, in the first of which (hydrophilic modification) an average of between 0.7 and 4 hydrophilic substituents are introduced for each anhydroglycosidic unit of a natural galactomannan or of a modified galactomannan containing less than 0.7 hydrophilic substituents per anhydroglycosidic unit, whereas in the second stage (hydrophobic modification) between 0.0001 and 0.02 hydrophobic substituents are introduced.

4,960,877

DNA HAVING GENETIC INFORMATION OF L-α-GLYCEROPHOSPHATE OXIDASE AND APPLICATION THEREOF

Hitoshi Sagai, Mishima; Keiko Nogata, and Mamoru Takahashi, both of Shizuoka, all of Japan, assignors to Toyo Jozo Co., Ltd., Shizuoka, Japan

Filed Dec. 12, 1988, Ser. No. 283,463

Claims priority, application Japan, Dec. 15, 1987, 62-317129

Int. Cl.[5] C12N *15/53, 1/21*

U.S. Cl. 536—27 **8 Claims**

1. Isolated DNA having a base sequence encoding a polypeptide having an amino acid sequence starting from the N-terminal end:

A—PheSerAsnLysThrArgGlnAspSerIleGlnLysMetGlnGlnGlu
GluLeuAspLeuLeuIleIleGlyGlyGlyIleThrGlyAlaGlyValAlaVal
GlnAlaAlaAlaSerGlyIleLysThrGlyLeuIleGluMetGlnAspPheAla
GluGlyThrSerSerArgSerThrLysLeuValHisGlyGlyIleArgTyrLeu
LysThrPheAspValGluValValAlaAspThrValGlyGluArgAlaVal
ValGlnGlyIleAlaProHisIleProLysProAspProMetLeuLeuProIle
TyrGluAspGluGlyAlaThrThrPheAsnMetPheSerValLysValAla
MetAspLeuTyrAspLysLeuAlaAsnValThrGlyThrLysTyrGluAsn
TyrThrLeuThrProGluGluValLeuGluArgGluProPheLeuLysLys
GlyArgLeuLysGlyAlaGlyValTyrLeuAspPheArgAsnAsnAspAla
ArgLeuValIleAspAsnIleLysLysAlaAlaGluAspGlyAlaTyrLeuVal
SerLysMetLysAlaValGlyPheLeuTyrGluGlyAspGlnIleValGly
ValLysAlaArgAspLeuLeuThrAspGluValIleGluIleLysAlaLysLeu
ValIleAsnThrSerGlyProTrpValAspLysValArgAsnLeuAsnPhe
ThrArgProValSerProLysMetArgProThrLysGlyIleHisLeuValVal
AspAlaLysLysLeuProValProGlnProThrTyrPheAspThrGlyLys
GlnAspGlyArgMetValPheAlaIleProArgGluAsnLysThrTyrPhe
GlyThrThrAspThrAspTyrGlnGlyAspPheThrAspProLysValThr
GlnGluAspValAspTyrLeuLeuAspValIleThrHisArgTyrProGlu

-continued

AlaAsnIleThrLeuAlaAspIleGluAlaSerTrpAlaGlyLeuArgProLeu
LeuIleGlyAsnSerGlySerAspTyrAsnGlyGlyAspAsnGlySerIleSer
AspLysSerPheAsnLysValValAspThrValSerGluTyrLysGluAsn
LysValSerArgAlaGluValGluAspValLeuAsnHisLeuGluAsnSer
ArgAspGluLysAlaProSerThrIleSerArgGlySerSerLeuGluArg
GluProAspGlyLeuLeuThrLeuSerGlyGlyLysIleThrAspTyrArg
LysMetAlaGluGlyAlaLeuArgLeuIleArgGlnLeuLeuLysGluGlu
TyrGlyIleGluThrLysGluIleAspSerLysLysTyrGlnIleSerGly
GlyAsnPheAspProThrLysLeuGluGluThrValThrGluLeuAlaLys
GluGlyValAlaAlaGlyLeuGluGluGluAspAlaThrTyrIleAlaAsp
PheTyrGlyThrAsnAlaArgArgIlePheGluLeuAlaLysGluMetAla
ProTyrProGlyLeuSerLeuAlaGluSerAlaArgLeuArgTyrGlyLeu
GluGluGluMetValLeuAlaProGlyAspTyrLeuIleArgArgThrAsn
HisLeuLeuPheGluArgAspGlnLeuAspGluIleLysGlnProValIle
AspAlaIleAlaGluTyrPheGlyTrpThrGluGluGluLysAlaGlnGln
ThrLysArgLeuGluAlaLeuIleAlaGluSerAspLeuArgGluLeuLys
GlyGluLys—B

wherein A represents an amino acid residue or a hydrogen atom and B represents an amino acid residue or an —OH group.

4,960,878

SYNTHESIS OF METHYLALUMINOXANES

Clark C. Crapo, Houston, and Dennis B. Malpass, LaPorte, both of Tex., assignors to Texas Alkyls, Inc., Deer Park, Tex.

Filed Dec. 2, 1988, Ser. No. 279,377

Int. Cl.[5] C07F *5/06*

U.S. Cl. 556—179 **10 Claims**

1. A process for the synthesis of methylaluminoxane which comprises reaction of a tetraalkyldialuminoxane containing C_2 or higher alkyl groups with an amount of trimethylaluminum that is not in stoichiometric excess.

4,960,879

PROCESS FOR CARBAPENEM INTERMEDIATES

Shoichiro Uyeo, Kyoto, Japan, assignor to Shionogi & Co., Ltd., Osaka, Japan

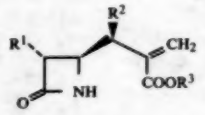
Filed Mar. 3, 1989, Ser. No. 318,717

Claims priority, application Japan, Mar. 23, 1988, 63-70763

Int. Cl.[5] C07D *205/08*

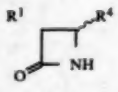
U.S. Cl. 540—200 **17 Claims**

1. A process for the preparation of a 4β-(1β-alkyl-2-carboxyprop-2-enyl) azetidin-2-one of the formula



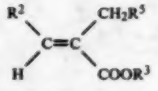
(II)

which comprises reacting a 4-(leaving group substituted) azetidin-2-one of the formula



(I)

with a trans-2-(leaving group substituted) methyl-3-akylacrylic acid of the formula



(III)

and a reducing metal having an oxido-reduction potential of −0.1 to −0.8 volt, wherein

R^1 is hydrogen, 1C to 10C alkyl, 1C to 10C haloalkyl, 4C to 8C dioxolenyl, or 1C to 10C hydroxyalkyl in which the hydroxy group is unprotected or is protected by a hydroxy protecting group,

R^2 is 1C to 8C alkyl or 1C to 8C substituted by a member selected from the group consisting of halogen, cyano, carbamoyl, carboxy, protected carboxy, alkenyl, alkinyl, amino, ureido, formimidoyl, hydroxy, protected hydroxy, alkanoyloxy, carbamoyloxy, hydroxyalkyloxy, aminoalkoxy, haloalkoxy, alkylthio, aminoalkylthio, hydroxyalkylthio, protected hydroxyalkylthio, haloalkylthio, alkylsulfinyl, aminoalkylsulfinyl, hydroxyalkylsulfinyl, protected hydroxyalkylsulfinyl, haloalkylsulfinyl, alkylsulfonyl, aminoalkylsulfonyl, hydroxyalkylsulfonyl, protected hydroxyalkylsulfonyl and haloalkylsulfonyl,

R^3 is hydrogen or a carboxy protecting group, and

R^4 and R^5 each is hydroxy, halogen, 1C to 8C alkanoyloxy which is unsubstituted or is further substituted, 7C to 15C aroyloxy, 1C to 8C alkylsulfonyloxy, 6C to 10C arylsulfonyloxy, 1C to 8C alkylsulfinyl, or 6C to 10C arylsulfinyl.

4,960,880

ALKENYLSILYLAZETIDINONE INTERMEDIATES FOR CARBAPENEMS

Shoichiro Uyeo, Kyoto, Japan, assignor to Shionogi & Co., Ltd., Osaka, Japan

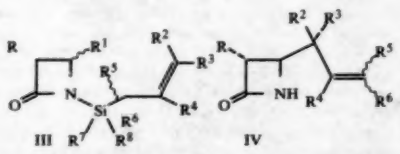
Filed Sep. 21, 1988, Ser. No. 247,264

Claims priority, application Japan, Sep. 22, 1987, 62-238066

Int. Cl.[5] **C07D** *205/08, 401/12, 403/12;* **C07F** *7/10*

U.S. Cl. 540—200 **4 Claims**

1. A process for preparing a 4(alk-2-enyl)-2-azetidinone of the formula (IV) which comprises treating a 4-(leaving group substituted)-1-(alk-2-enyl) silyl-2-azetidinone of the formula (III) with an acid in an inert solvent, said formulas III and IV being as follows:



III IV

wherein R is hydrogen, alkyl, alkyl substituted by hydroxy, protected hydroxy or alkyl substituted by one halogen, R^1 is a leaving group, R^2 is alkyl, aryl, substituted alkyl or substituted aryl in which the substituents on the alkyl or aryl groups are selected from the group consisting of hydroxy, 1 C to 8 C alkoxy, 6 C to 10 C aryloxy, 1 C to 10 C acyloxy, 7 C to 19 C aralkoxy, oxo, 6 C to 10 C arylthio, furylthio, thienylthio, pyrrolylthio, oxazolylthio, thiazolylthio, imidazolylthio, oxadiazolylthio, thiadiazolylthio, triazolylthio, thiatriazolylthio, tetrazolylthio, pyridylthio, pyranylthio, indolylthio, benzofurylthio, benzothienylthio, benzoimidazolylthio, benzothiazolylthio, benzopyrazinylthio, quinolylthio, pyridopyridylthio, 1 C to 8 C alkylthio, amino, 1 C to 8 C mono- or di-alkylamino, tetrazol-1-yl, triazol-1-yl, halogen, nitrile and isonitrile, R^3 is hydrogen, R^4 is hydrogen, 1 C to 8 C alkyl, 1 C to 8 C alkyl substituted by halogen, oxo, furylthio, thienylthio, pyrrolylthio, oxazolylthio, thiazolylthio, imidazolylthio, oxadiazolylthio, thiadiazolylthio, triazolylthio, thiatriazolylthio, tetrazolylthio, pyridylthio, pyranylthio, indolylthio, benzofurylthio, benzothienylthio, benzoimidazolylthio, benzothiazolylthio, benzopyrazinylthio, quinolylthio, pyridopyridylthio, R^5 and R^6 each is hydrogen, alkyl, substituted alkyl, aryl, substituted aryl, carboxy, or protected carboxy, R^7 and R^8 each is hydrogen, alkyl, substituted alkyl, aryl or substituted aryl, wherein the substituents on the alkyl and aryl groups in R^5, R^6, R^7 and R^8 are selected from the group consisting of hydroxy, 1 C to 8 C alkoxy, 6 C to 10 C aryloxy, 1 C to 10 C acyloxy, 7 C to 19 C aralkoxy, 6 C to 10 C arylthio, furyl, thienyl, pyrrolyl, oxazolyl, thiazolyl, imidazolyl, oxadiazolyl, thiadiazolyl, triazolyl, thiatriazolyl, tetrazolyl, pyridyl, pyranyl, indolyl, benzofuryl, benzothienyl, benzoimidazolyl, benzothiazolyl, benzopyrazinyl, quinolyl, pyridopyridyl, 1 C to 8 C alkylthio, amino, 1 C to 8 C mono- or di-alkylamino, tetrazol-1-yl, triazol-1-yl, halogen, trialkylsilyl, dialkyl alkoxysilyl and trialkylstannyl.

4,960,881

ALPHA-CHLORINATED CARBONATES, THEIR METHOD OF MANUFACTURE AND APPLICATION IN THE PROTECTION OF THE AMINE FUNCTIONS OF AMINO ACIDS

Gerard Barcelo, Genevieve Des Bois; Jean-Pierre Senet, Buthiers, and Gerard Sennyey, Saint-Aubin, all of France, assignors to Societe Nationale Des Poudres et Explosifs, Paris Cedex, France

Continuation-in-part of Ser. No. 893,651, Aug. 6, 1986, abandoned, which is a division of Ser. No. 701,429, Feb. 14, 1985, Pat. No. 4,652,665. This application Jun. 6, 1988, Ser. No. 203,471

Claims priority, application France, Feb. 16, 1984, 84 02328

Int. Cl.[5] **C07D** *499/48, 207/08*

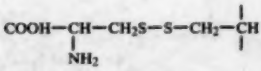
U.S. Cl. 540—326 **18 Claims**

1. A method of blocking the amino or imino group of a compound which is an amino or imino carboxylic acid of molecular weight up to 1,000 which is

(a) R^4—NH —R^3—COOH wherein R^4 is hydrogen or lower alkyl of 1-4 carbon atoms and R^3

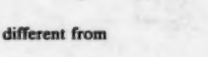
(1) is linear or branched C_1–C_{20} alkylene or C_2–C_{20} linear or branched alkenylene or C_3–C_6 cycloalkylene radical which are unsubstituted or substituted with at least one substituent which is carboxyl or ester thereof, amino, NH, =NH, substituted amino, substituted =NH, —$CONH_2$, benzyl, cyano, mercapto, substituted mercapto, hydroxy, substituted hydroxy, 5-imidazolyl, substituted imidazolyl, 3-indolyl, guanidino, substituted guanidino, phenyl or phenoxyphenyl, said phenyl or phenoxyphenyl being unsubstituted or substituted by (1) halogen, (2) hydroxy, (3) both halogen and hydroxy, or (4) substituted hydroxy;

(2) or R_3 is



or (b) the compound is proline, 3,4-dehydro-proline, homoproline, hydroxyproline, said hydroxyproline being unsubstituted or substituted, or azetidine;

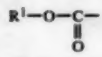
or (c) the compound is 6-aminopenicillanic acid which consists of reacting said compound with an alpha-chlorinated carbonate of formula:



wherein R^1 is different from

and is a saturated or ethylenically unsaturated primary, secondary or tertiary C_1–C_{20} alkyl or C_7–C_{20} aralkyl, said R^1 being unsubstituted or substituted with at least one substituent which is a member selected from the group consisting of halogen, C_1–C_6 trialkylsilyl and nitro, in a solvent medium in the presence of an acid scavenger at a

temperature between −5° C. and 100° C., whereby the amino or imino group of said amino or imino carboxylic acid is blocked by the group



and isolating said blocked amino or imino carboxylic acid from the reaction mixture.

4,960,882

PROTON IONIZABLE MACROCYCLIC COMPOUNDS

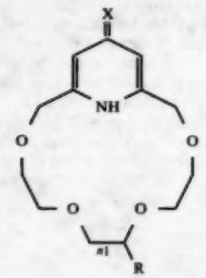
Jerald S. Bradshaw; Reed M. Izatt, and Virginia B. Christensen, all of Provo, Utah, assignors to Brigham Young University, Provo, Utah

Division of Ser. No. 36,664, Apr. 8, 1987, abandoned. This application Dec. 12, 1988, Ser. No. 283,610

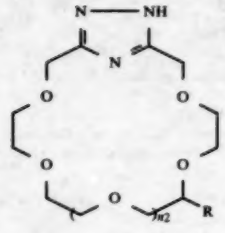
Int. Cl.[5] **C07F** *9/655;* **C07D** *498/06*

U.S. Cl. 540—468 **16 Claims**

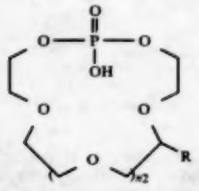
1. Compounds selected from the group consisting of



(A)



(B)



(C)

where X is a member selected from the group consisting of O and S; R is a hydrocarbon chain having from 6 to 18 carbon atoms and 13 to 37 hydrogen atoms; n_1 is an integer from 0 to 4; and n_2 is an integer from 0 to 3.

4,960,883

PIPERAZINES AND HOMOPIPERAZINES

Sohei Tanabe, Higashimurayama; Seiichi Sato, Tokyo; Yoshinori Kyotani, Higashiyamato; Tomio Ohta, Sayama, and Yasumi Uchida, Ichikawa, all of Japan, assignors to Kowa Company, Ltd., Aichi, Japan

Filed Feb. 15, 1989, Ser. No. 310,683

Claims priority, application Japan, Feb. 16, 1988, 63-31931

Int. Cl.[5] **C07D** *243/08, 241/50, 413/06, 405/08*

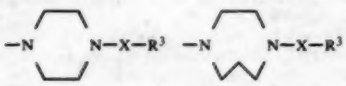
U.S. Cl. 540—575 **6 Claims**

1. A compound represented by the following formula

(I)

wherein R represents a C_1–C_6 alkyl group; one of A and B represents a group of the formula

and the other represents a group of the formula



in which R^1 and R^2 are identical or different and each represents a hydrogen, a lower alkyl, a phenyl or naphthyl which is optionally substituted by 1 to 3 substituents selected from the group consisting of halogen, C_1–C_6 alkyl, C_1–C_6 alkoxy, nitro, cyano and hydroxy or C_1–C_6 alkyl substituted by a phenyl or naphthyl which is optionally substituted by 1 to 3 substituents selected from the group consisting of halogen, C_1–C_6 alkyl, C_1–C_6 alkoxy, nitro, cyano and hydroxy, R^3 represents a C_1–C_6 alkyl group unsubstituted or substituted by a member selected from the group consisting of halogen, C_1–C_6 alkoxy, nitro and nitroxy, a phenyl or naphthyl unsubstituted or substituted by 1 to 3 substituents selected from the group consisting of halogen, C_1–C_6 alkoxy, nitro, cyano and hydroxy or a heterocyclic group which is selected from the group consisting of pyridyl, quinolyl, isoquinolyl, thienyl, furyl, indolyl, piperidino, piperidinyl, morpholino and morpholinyl groups and which is optionally substituted by 1 to 3 substituents selected from the group consisting of halogen, C_1–C_6 alkyl, C_1–C_6 alkoxy, nitro, cyano and hydroxy, and X represents a sulfonyl or a carbonyl, and a pharmaceutically acceptable acid addition salt thereof.

4,960,884

PESTICIDAL 2-FLUOROETHYL ETHERS

David M. Roush, Princeton, N.J.; Donald A. Shaw, Philadelphia, Pa.; Michael L. Jones, Durham, N.C., and Jun H. Chang, Princeton Junction, N.J., assignors to FMC Corporation, Philadelphia, Pa.

Continuation of Ser. No. 318,437, Mar. 2, 1989, abandoned, which is a continuation of Ser. No. 64,278, Jun. 19, 1987, abandoned. This application Aug. 28, 1989, Ser. No. 399,448

Int. Cl.[5] **C07C** *76/02, 79/35;* **A01N** *33/18*

U.S. Cl. 514—721 **6 Claims**

1. A method for controlling pests which damage agricultural crops which comprises applying to the locus where control is desired an insecticidally, acaricidally, or nematically effective

amount of a 2-fluoroethyl ether of the formula $R^1R^2{}_mAr(-(OCH_2CH_2F)_n$ in which:

Ar is phenyl and n is 1 to 3, or Ar is naphthyl and n is 1 or 2, or Ar is phenylmethyl, (alkyl)(phenyl)methyl, diphenylmethyl, or naphthylmethyl and n is 1; and

(a) m is 0 and R^1 is selected from halogen, halomethyl, hydroxymethyl, fluoroethoxymethyl, alkoxy, difluoromethoxy, hydroxy, phenoxy, phenyl, fluoroethoxyphenyl, with the proviso that Ar is other than naphthyl when R^1 is hydroxy; or

(b) m is 1, R^1 is selected from alkyl, and halogen, and R^2 is halogen or

(c) m is 2–5, and R^1 methyl is or halogen and R^2 is halogen.

4,960,885

PROCESS FOR PRODUCING METHYLENE BIS(PHENOTHIAZINES)

Raymond C. DeWald, Douglassville, and Paul O. Hong, Paoli, both of Pa., assignors to Occidental Chemical Corporation, Niagara Falls, N.Y.

Continuation-in-part of Ser. No. 79,315, Jul. 30, 1987, Pat. No. 4,855,424. This application Feb. 16, 1989, Ser. No. 344,169

Int. Cl.[5] **C07D** *279/20*

U.S. Cl. 544—35 **10 Claims**

1. A process for producing a dimer of phenothiazine and formaldehyde in a diluent comprising reacting about 1 to about 25 weight percent phenothiazine, based on the weight of said diluent, with formaldehyde in a molar ratio to said phenothiazine of about 0.1 to less than 1 in the presence of a liquid diluent that is a solvent for the phenothiazine, but a non-solvent for said dimer, said diluent comprising a mixture of a polar solvent and a non-polar solvent in a weight ratio in the range of about 0.1 to 10.

4,960,886

CHARGE TRANSFER COMPLEX FORMED BETWEEN BENZOQUINONE DERIVATIVE AND ELECTRON DONOR AND PROCESS FOR PRODUCING THE SAME

Toshio Mukai; Yoshiro Yamashita, and Takanori Suzuki, all of Miyagi, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo and Toshio Mukai, Miyagi, both of, Japan

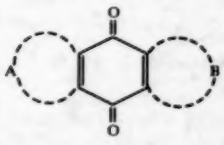
Filed Dec. 11, 1987, Ser. No. 131,665

Claims priority, application Japan, Dec. 15, 1986, 61-298371; Dec. 15, 1986, 61-298372; Dec. 15, 1986, 61-298373

Int. Cl.[5] **C07D** *279/18, 327/04*

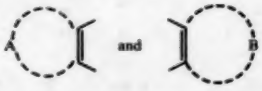
U.S. Cl. 544—35 **9 Claims**

1. A charge transfer complex formed between a benzoquinone derivative represented by formula (I)

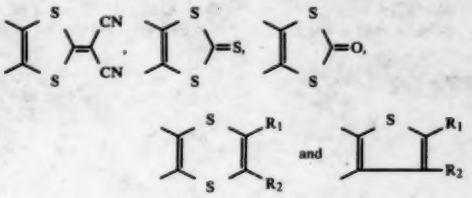


(I)

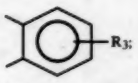
wherein one of



represents a heterocyclic ring selected from the group consisting of



and the other represents one of said heterocyclic rings or a group of formula



R_1, R_2, and R_3 each represents a hydrogen atom, an alkyl group, an aryl group, an aralkyl group, an alkoxy group, a halogen atom, a nitro group, a cyano group, or a carboxylic ester group, and an electron donor.

4,960,887

PROCESS FOR THE PREPARATION OF PYRIMIDINES

Stephen Lachhein, Hofheim am Taunus, and Hans-Joachim Ressel, Hattersheim am Main, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

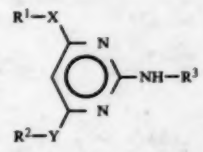
Filed Feb. 16, 1988, Ser. No. 156,182

Claims priority, application Fed. Rep. of Germany, Feb. 18, 1987, 3705084

Int. Cl.[5] **C07D** *239/42, 239/52, 239/58*

U.S. Cl. 544—320 **10 Claims**

1. A process for the preparation of a compound of the formula I



I

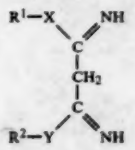
in which

X and Y independently of one another are oxygen or sulfur and

R^1 and R^2 independently of one another are $(C_1–C_4)$alkyl, $(C_1–C_4)$alkoxy-$(C_1–C_2)$alkyl or halogeno-$(C_1–C_4)$alkyl and

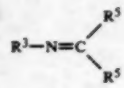
R^3 is H or a radical —COR^4 in which R^4 is $(C_1–C_4)$alkyl, halogeno-$(C_1–C_4)$alkyl, $(C_1–C_4)$alkoxy, halogeno$(C_1–C_4$-)alkoxy, phenyl or phenoxy, the latter both of which are unsubstituted or monosubstituted to trisubstituted by halogen, $(C_1–C_4)$alkoxy or $(C_1–C_4)$alkyl,

which comprises reacting a propanediimidate of the formula II



II

in which R^1 and R^2 are as defined in formula I, or one of its salts, in an inert solvent and in the presence of a base, with a carbonic acid imine derivative of the formula III



III

in which

R^3 is as defined in formula I and

the R^5s independently of one another are halogen, (C_1–C_4)alkoxy, (C_1–C_4)alkylthio, phenoxy or phenylthio,

to provide a compound of the formula I.

4,960,888

PREPARATION OF 6-AMINO-1,2-DIHYDRO-1-HYDROXY-2-IMINO-4-PIPERIDINOPYRIMIDINE COMPOUNDS

András Vedres; Csaba Szántay; Béla Stefkó; János Kreidl; András Nemes; Gábor Blaskó; Erik Bogsch; Dénes Máthé; István Hegedüs; Adrien Szechovszky, née Gergely, and Tamás Mester, all of Budapest, Hungary, assignors to Richter Gedeon Vegyeszeti Gyar R.T., Budapest, Hungary

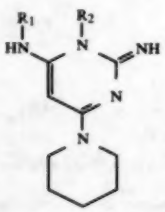
Division of Ser. No. 72,009, Jul. 10, 1987, abandoned. This application Mar. 9, 1989, Ser. No. 320,875

Claims priority, application Hungary, Jul. 10, 1986, 2855/86

Int. Cl.[5] C07D *239/34*

U.S. Cl. 544—323 **7 Claims**

1. A 4-piperidinopyrimidine of the formula



wherein

R_1 is hydrogen or a

group, wherein

R is a C_{1-6} alkyl group or an unsubstituted or halogen substituted aryl group; and

R_2 is an

group, wherein

R is as defined above.

4,960,889

7-ACYLAMINO-3-VINYLCEPHALOSPORANIC ACID DERIVATIVES AND PROCESSES FOR THE PREPARATION THEREOF

Takao Takaya, Kawanishi; Hisashi Takasugi, Osaka; Takashi Masugi, Ikeda; Hideaki Yamanaka, Hirakata, and Kohji Kawabata, Osaka, all of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

Continuation of Ser. No. 127,929, Dec. 2, 1987, abandoned, which is a division of Ser. No. 889,189, Jul. 24, 1986, abandoned. This application Jan. 3, 1990, Ser. No. 462,347

Claims priority, application United Kingdom, Nov. 19, 1979, 7939985; Feb. 8, 1980, 8004335; Apr. 21, 1980, 8012991; Jul. 14, 1980, 8022920

Int. Cl.[5] C07D *213/73, 239/42*

U.S. Cl. 544—329 **1 Claim**

1. A compound of the formula:

$R_d^1—A^{14}—R^e$

in which

R_d^1 is aminopyridyl, protected aminopyridyl, aminopyrimidinyl or protected aminopyrimidinyl,

A^{14} is lower alkylene having a group of the formula: $=N\sim OR_f^4$, wherein R_f^4 is lower alkyl substituted by carboxy or a protected carboxy group, and

R^e is carboxy or a protected carboxy group,

or a salt thereof.

4,960,890

METHINE DYES WHICH HAVE AT LEAST ONE HETEROCYCLE CONTAINING TWO NITROGEN ATOMS AND PREPARATION THEREOF

Ewald Daltrozzo, Konstanz, and Werner Sulger, Ueberlingen-Nussdorf, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

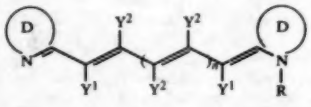
Continuation of Ser. No. 172,594, Mar. 24, 1988, Pat. No. 4,876,347, which is a continuation of Ser. No. 907,216, Sep. 18, 1986, Pat. No. 4,751,309. This application Oct. 5, 1989, Ser. No. 417,309

Claims priority, application Fed. Rep. of Germany, Sep. 21, 1985, 3533772

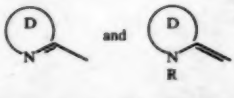
Int. Cl.[5] C07D *241/36, 401/06, 211/70, 211/82, 213/06, 215/12, 487/00*

U.S. Cl. 544—353 **13 Claims**

1. A methine dye having the formula:

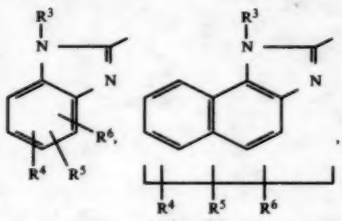


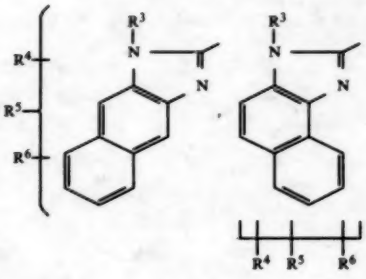
or the tautomeric forms thereof, where each Y^1 is the same or different and is selected from the group consisting of cyano, trifluoromethyl, nitro, carbo-C_1–C_{12}-alkoxy, phenylsulfonyl or phenylsulfonyl which is monosubstituted or disubstituted by C_1–C_{12}-alkyl, C_1–C_{12}-alkoxy, chlorine, bromine, fluorine, and cyano, Y^2 is in each case, independently of the other, hydrogen, cyano, chlorine, bromine, fluorine, C_1–C_6-alkyl, C_5–C_7-cycloalkyl, phenyl, or pyridyl, R is hydrogen, C_1–C_{20}-alkyl, C_7–C_{10}-aralkyl or β-hydroxyethyl, and n is 1, 2, 3, 4, 5 or 6, and the groups

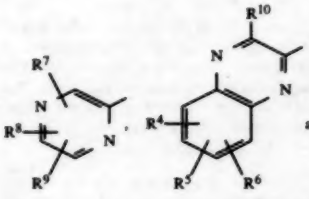


and

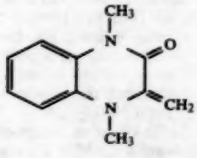
are identical or different and are selected from the group consisting of



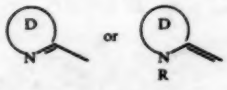




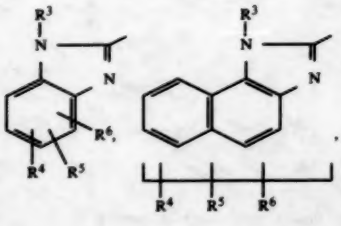
and



or one



is



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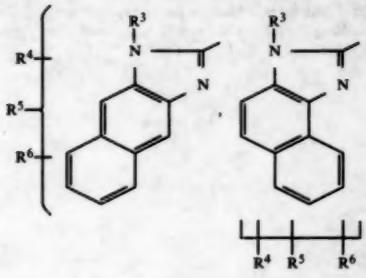
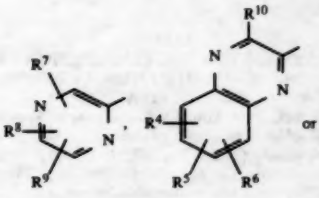
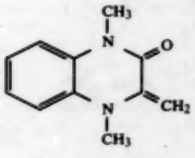
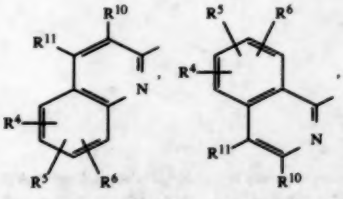
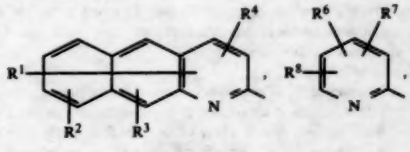


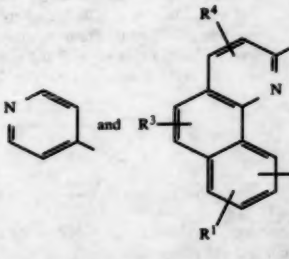




and the other radical D is selected from the group consisting of







wherein R^1–R^9, R^{10} and R^{11} independently of one another are

each hydrogen, chlorine, bromine, fluorine, —CN, —CF_3, nitro, C_1–C_4-alkyl, C_1–C_4-alkoxy, unsubstituted phenyl or phenyl substituted by chlorine, bromine, fluorine, C_1–C_4-alkyl, C_1–C_4-alkoxy, —CN, —CF_3 or —NO_2, only one nitro group being present per radical D.

4,960,891

PROCESS FOR THE PREPARATION OF DECAHYDRO-8H-ISOQUINO[2,1-G][1,6]NAPHTHYRIDINE DERIVATIVES

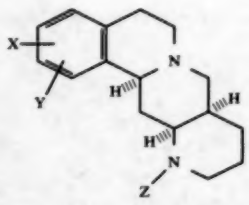
Robin D. Clark, Palo Alto, Calif., assignor to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Continuation-in-part of Ser. No. 257,372, Nov. 12, 1988, which is a continuation-in-part of Ser. No. 174,750, Mar. 29, 1988, Pat. No. 4,886,798, which is a continuation-in-part of Ser. No. 37,320, Apr. 13, 1987, Pat. No. 4,791,108. This application Apr. 11, 1989, Ser. No. 336,993

Int. Cl.[5] C07D *455/03*

U.S. Cl. 546—48 **29 Claims**

1. A process for the preparation of a compound, as a single enantiomer or mixture of enantiomers, represented by the formula:



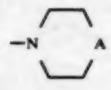
(IA)

wherein:

X and Y are independently hydrogen; hydroxy; lower alkyl of one to six carbon atoms; lower alkoxy of one to six carbon atoms; or halo; or X and Y when adjacent and taken together is methylenedioxy or ethylene-1,2-dioxy, and

Z is —SO_2R, in which;

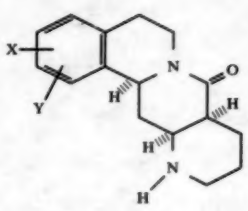
R is lower alkyl of one to six carbon atoms; phenyl optionally substituted by one or two substituents chosen from halo, amino, lower alkyl or one to four carbon atoms and lower alkoxy groups of one to four carbon atoms; —$(CH_2)_mOR^1$; or —NR^1R^2; wherein m is an integer of 1 to 6 and R^1 and R^2 are independently lower alkyl; or R^1 and R^2 taken together with the nitrogen to which they are attached represent a heterocycle of the formula:



wherein A is —CH_2—, —NR^1— or oxygen;

which process comprises:

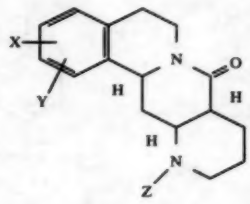
(A) contacting a compound of the formula:



(2)

wherein X and Y are as defined above: with a compound of the formula RSO_2Cl or RSO_2Br;

where R is as defined above, to give a highly crystalline compound of the formula:



(3a)

wherein X, Y and Z are as defined above, followed by:

(B) contacting the compound of formula (3a) with a reducing agent chosen from the group consisting of lithium aluminum hydride, borane, triethyloxonium fluoroborate followed by sodium borohydride, sodium borohydride in the presence of a carboxylic etherate.

4,960,892

NAPHTHALENEPROPIONIC ACID DERIVATIVES AS ANTI-INFLAMMATORY/ANTI-ALLERGIC AGENTS

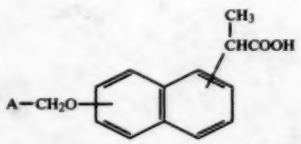
Anthony F. Kreft, III, Trooper; John H. Musser, Yardley, both of Pa.; James J. Bicksler, Cranbury, N.J.; John W. Giberson, Newtown, and Dennis M. Kubrak, Fairless Hills, both of Pa., assignors to American Home Products Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 202,975, Jun. 10, 1988, abandoned, which is a continuation-in-part of Ser. No. 80,122, Jul. 31, 1987, abandoned. This application May 12, 1989, Ser. No. 351,119

Int. Cl.[5] C07D *215/14*

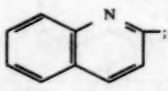
U.S. Cl. 546—152 **6 Claims**

1. A compound having the formula:



wherein

A is



and the pharmaceutically acceptable salts thereof.

4,960,893

7-BROMOMETHYL-5-HALO-8-HYDROXYQUINOLINE AND METHOD OF PREPARATION

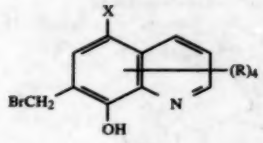
Gordon C. Dunmore, Alberta, Canada, assignor to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 77,356, Jul. 24, 1987, abandoned. This application Nov. 16, 1988, Ser. No. 272,152

Int. Cl.[5] C07D *215/28*

U.S. Cl. 546—179 14 Claims

1. A 5-halo-7-bromemethyl-8-hydroxyquinoline which corresponds to the formula



wherein X is chlorine, bromine or iodine; and R is independently in each occurrence H or alkyl.

4,960,894

PREPARATION OF SUBSTITUTED PYRIDINES

Wolfgang Hoelderich, Frankenthal, and Norbert Goetz, Worms, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

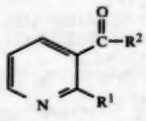
Filed Dec. 1, 1988, Ser. No. 278,362

Claims priority, application Fed. Rep. of Germany, Dec. 4, 1987, 3741160

Int. Cl.[5] C07D *213/09, 213/12*

U.S. Cl. 546—250 7 Claims

1. A process for the preparation of substituted pyridines of the formula (I),



(I)

wherein R^1 is hydrogen or C_1–C_{12}-alkyl and R^2 is methyl, ethyl or C_1–C_3-alkoxy, which comprises: reacting acrolein and ammonia with a dicarbonyl compound of the formula (II),

$$R^2—CO—CH_2—CO—R^1$$

or, if R^1 is hydrogen, optionally with an acetal of the compound of formula (II), in the presence of an acidic zeolite catalyst and either in the gas phase at a temperature of 100° C. to 500° C. or in the liquid phase at a temperature of 20° C. to 200° C.

4,960,895

4'-ALKOXY-2,2':6',2''-TERPYRIDINE DERIVATIVES

Atsuhiro Ohkawa, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

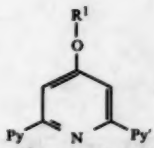
Filed Feb. 13, 1989, Ser. No. 309,649

Claims priority, application Japan, Feb. 12, 1988, 63-28897; Jul. 19, 1988, 63-178097

Int. Cl.[5] C07D *401/14*

U.S. Cl. 546—257 1 Claim

1. A 4'-alkoxy-2,2':6',2''-terpyridine derivative of formula (I):



(I)

where R^1 represents a primary alkyl group selected from the group consisting of methyl, ethyl, propyl, butyl, pentyl, hexyl, octyl, nonyl, decyl, undecyl, dodecyl, tridecyl, tetradecyl, pentadecyl, hexadecyl, octadecyl, nonadecyl, icosyl, 2-methoxyethyl, (2'-methoxy)-2-ethoxymethyl, 3-mercaptomethylpropyl, 4-ethylhexyl, benzyl or 2-phenylethyl; a secondary alkyl group selected from the group consisting of isopropyl, 3-octyl, cyclohexyl and 1-phenylethyl; or a tertiary alkyl group selected from the group consisting of 2-methyl-2-propyl and 2-phenyl-2-propyl; Py and Py' each represent a group selected from the group consisting of 2-pyridyl, 6-methyl-2-pyridyl, 6-phenyl-2-pyridyl, 4-methyl-2-pyridyl, 4-vinyl-2-pyridyl and 6-vinyl-2-pyridyl.

4,960,896

PROCESS FOR THE PREPARATION OF 5-CHLORO AND 5-BROMO-2-HYDROXYNICOTINIC ACIDS

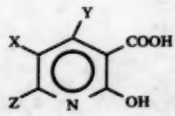
Young S. Lo, Richmond, Va., assignor to A. H. Robins Company, Inc., Richmond, Va.

Continuation-in-part of Ser. No. 801,725, Nov. 26, 1985, abandoned. This application Nov. 13, 1987, Ser. No. 120,488

Int. Cl.[5] C07D *213/72, 213/61*

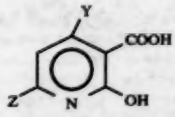
U.S. Cl. 546—298 10 Claims

1. A process for the preparation of a 5-halo-2-hydroxynicotinic acid compound selected from the group having the formula:



wherein X is selected from chlorine or bromine and Y and Z are selected from hydrogen, loweralkyl or loweralkoxy which comprises the steps of:

Step 1, reacting a 2-hydroxynicotinic acid compound having the formula:



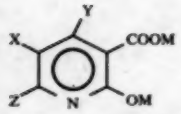
wherein Y and Z are selected from hydrogen, loweralkyl or loweralkoxy in aqueous solution containing both a hypohalite salt having the formula:

MOX

and a base having the formula:

MOH

wherein M is an alkali-metal ion selected from sodium, potassium or lithium and X is chlorine or bromine and said base is present in amount sufficient to raise the pH of said aqueous solution to at least 12 to give a solution containing a compound having the formula:



wherein X, Y and Z have the starting values of the reactants and M is alkali-metal;

Step 2, optionally adding to the solution prepared in Step 1, an amount of reducing agent sufficient in amount to eliminate hypohaous ion and free chlorine from said solution;

Step 3, mixing the solution obtained in Steps 1 or 2 with strong acid solution in an amount sufficient to substantially precipitate a said 5-halo-2-hydroxynicotinic acid and separating it from the slurry.

4,960,897

HERBICIDE CONTAINING 1-(HALOGENOMETHYL)-VINYL PYRIDINES

Tetsuo Jikihara, Komae; Manabu Katsurada, Yokohama; Toyohiko Shike, Machida; Emiko Mikami, and Osamu Ikeda, both of Machida, all of Japan, assignors to Mitsubishi Kasei Corporation, Tokyo, Japan

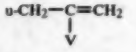
Filed Mar. 2, 1988, Ser. No. 163,086

Claims priority, application Japan, Mar. 4, 1987, 62-49434; Mar. 10, 1987, 62-54753

Int. Cl.[5] C07D *213/26*

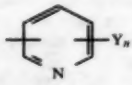
U.S. Cl. 546—346 **5 Claims**

1. A 1-(halogenomethyl)vinylpyridine represented by the following formula (V):



(V)

wherein u represents a halogen atom, and V represents a pyridyl group represented by the formula:



wherein Y represents a halogen atom, an alkyl group having 1 to 4 carbon atoms, a haloalkyl group having 1 to 2 carbon atoms, an alkoxy group having 1 to 4 carbon atoms, a haloalkoxy group having 1 to 2 carbon atoms or a group represented by $S(O)_qT$ (wherein T represents an alkyl group having 1 to 4 carbon atoms and q is 0, 1 or 2), Y_n may be the same or different from each other, and n represents 0, 1 or 2.

4,960,898

ORGANOSILICON COMPOUNDS

Koji Sakuta; Satoshi Kuwata, and Shigeru Mori, all of Gunma, Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

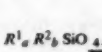
Filed Mar. 15, 1990, Ser. No. 494,026

Claims priority, application Japan, Mar. 16, 1989, 1-64485

Int. Cl.[5] C07F *7/10*

U.S. Cl. 548—110 **9 Claims**

1. Organosilicon compounds represented by the general formula:



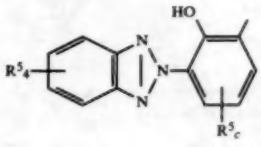
where a lies in the range $1 \leqq a \leqq 3$ and b lies in the range $0.001 \leqq b \leqq 2$,

R^1 are identical or dissimilar monovalent saturated or unsaturated hydrocarbons with 1–30 carbon atoms,

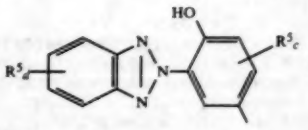
R^2 is a monovalent organic group represented by $-CR^3{}_2CR^3(H)CR^3{}_2-R^4$,

R^3 are hydrogen atoms or monovalent saturated hydrocarbon groups with 1–5 carbon atoms,

R^4 are monovalent organic groups represented by the formula:



or:



R^5 being identical to said R^1 or halogen atoms, alkoxy groups, carboxyl groups, hydroxyl groups or amino groups, d is an integer from 0 to 4 and c is an integer from 0 to 3.

4,960,899

N-SULPHENYLATED 2-AMINO-4-CHLORO-THIAZOLE-SULPHONAMIDES, THEIR USE, PROCESS FOR THEIR PREPARATION, AND THE INTERMEDIATES 2,4-DICHLOROTHIAZOLE-SULPHONYL CHLORIDE AND 2-AMINO-4-CHLORO-THIAZOLE-SULPHONAMIDES

Gunther Beck; Bernd Baasner, both of Leverkusen; Michael Schwamborn, Koeln, and Wilhelm Brandes, Leichlingen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Division of Ser. No. 308,180, Feb. 8, 1989, Pat. No. 4,906,650. This application Mar. 2, 1990, Ser. No. 487,679

Claims priority, application Fed. Rep. of Germany, Feb. 18, 1988, 3805058

Int. Cl.[5] C07D *277/36*

U.S. Cl. 598—186 **1 Claim**

1. 2,4-Dichloro-thiazole-sulphonyl chloride.

4,960,900

OXYIMINO DERIVATIVES OF THIAZOLE, METHOD OF PREPARATION AND USE IN THERAPY

Bernard Danree, Poissy; Patrick Houziaux, Bazemont; Jean-Yves Lacolle, La Celle Saint Cloud, and Jean-Pierre Riffaud, Versailles, all of France, assignors to Institut de Ercherches Chimiques et Biologiques Appliquees (I.R.C.E.B.A.), Vicq, France

Filed Dec. 23, 1988, Ser. No. 290,248

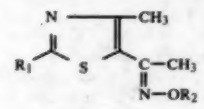
Claims priority, application France, Dec. 23, 1987, 87 18056

Int. Cl.[5] C07D *277/28, 417/12*

U.S. Cl. 548—203 **8 Claims**

1. An oxyiminothiazole compound selected from the group consisting of:

(i) the 5-(1-alkoxyimino- and 1-hydroxyimino-ethyl)-4-methylthiazoles of the formula



(I)

in which R_1 represents H, F, Cl, Br or CH_3 and R_2 represents a C_1–C_{10}-alkyl gorup, a benzyl group of the formula $CH_2C_6H_2(R_3)_3$, n which each R_3, identical or different, represents H, F, Cl, Br, CF_3, a C_1–C_4-alkyl group or a C_1–C_4-alkoxy group, a group CH_2COOR_4, in which R_4 represents H, a C_1–C_4-alkyl group or the ammonium group, NH_4^+, a group CH_2COOM_m, in which M is an alkali metal or alkaline earth metal and m is its valency, or a 2-aminoethyl group of the formula $CH_2CH_2NR_5R_6$, in which R_5 and R_6, which can be identical or different, each represent H or a C_1–C_4-alkyl group, it being possible for R_5 and R_6, taken together with the nitrogen atom to which they are bonded, to form a 5- to 7-membered N-heterocyclic group selected from the group consisting of pyrrolidino, piperidino, morpholino, thiomorpholino, 4-methylpiperazino, 4-phenylpiperazino, 4-(4-chlorophenyl)piperazino, 4-(2-hydroxyethyl)piperazino and hexamethyleneimino groups, it also being possible for R_2 to represent the hydrogen atom when R_1 is other than H;

(ii) the E and Z diastereoisomers thereof; and

(iii) the corresponding addition salts.

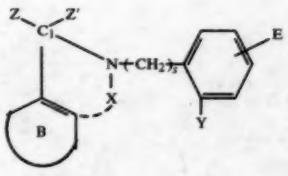
4,960,901

THERMAL IMAGING METHOD

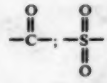
Alan L. Borror, Andover, and Ernest W. Ellis, Carlisle, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Division of Ser. No. 861,377, May 14, 1986, Pat. No. 4,720,449.
This application Oct. 29, 1987, Ser. No. 114,049
Int. Cl.[5] C07D *275/06, 491/113, 513/10*
U.S. Cl. 548—207 **7 Claims**

1. A substantially colorless di- or triarylmethane compound of the formula



wherein ring B represents a carbocyclic aryl ring or a heterocyclic aryl ring; C_1 represents the meso carbon atom of said di- or triarylmethane compound; X represents



or —CH_2—and completes a moiety ring-closed on said meso carbon, said moiety including the nitrogen atom bonded directly to said meso carbon; Y represents

wherein L is a leaving group that departs upon thermal fragmentation to unmask —N=C=O for effecting intramolecular acylation of said nitrogen atom to open the N-containing ring and form a new group in the ortho position of ring B that cannot bond to said meso carbon atom; E is hydrogen, an electron-donating group, an electron-withdrawing group or a group, either an electron-donating group or an electron-neutral group, that undergoes fragmentation upon heating to liberate an electron-withdrawing group; s is 0 or 1 and Z and Z' taken individually represent the moieties to complete the auxochromophoric system of a diarylmethane or triarylmethane dye when said N-containing ring is open and Z and Z' taken together represent the bridged moieties to complete the auxochromophoric system of a bridge triarylmethane dye when said N-containing ring is open.

4,960,902

TRIFLUOROMETHOXY SUBSTITUTED 1,3,4,9-TETRAHYDROPYRANO-(3,4-b)INDOLE-1-ACETIC ACIDS

Amedeo A. Failli, Princeton Junction, N.J., assignor to American Home Products Corporation, New York, N.Y.

Filed Aug. 19, 1988, Ser. No. 234,790
Int. Cl.[5] C07D *491/052*
U.S. Cl. 548—432 **1 Claim**

1. The compound 1-ethyl-1,3,4,9-tetrahydro-7-(trifluoromethoxy)pyrano[3,4-b]indole-1-acetic acid 3-oxo-1-isobenzofuranyl ester.

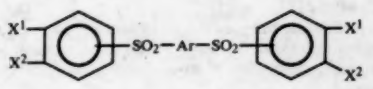
4,960,903

AROMATIC COMPOUNDS HAVING SULFONYL GROUPS

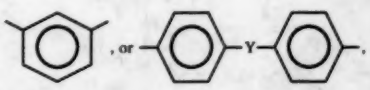
Yoshio Taguchi, Iruma; Chichiro Imai, Yokohama, and Yoshio Imai, Oota, all of Japan, assignors to Toa Nenryo Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 8, 1986, Ser. No. 939,105
Claims priority, application Japan, Dec. 16, 1985, 60-281077; Dec. 16, 1985, 60-281078
Int. Cl.[5] C07D *307/89, 403/10, 149/34, 147/06*
U.S. Cl. 548—461 **8 Claims**

1. An aromatic compound having sulfonyl groups, represented by the following formula,

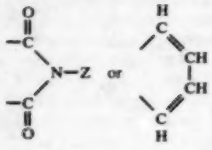


wherein Ar is



Y is a bond, oxygen atom, sulfur atom, SO_2, CH_2 or

X^1 and X^2 are simultaneously methyl groups or form



and Z is a hydrogen atom, alkyl group having 1 to 6 carbon atoms or aryl group having 6 to 8 carbon atoms.

4,960,904

PROCESS FOR THE PREPARATION OF CYCLIC SULPHATES

Pierre Le Roy, Lyons, and Bernadette Mandard-Cazin, Alfortville, both of France, assignors to Rhone-Poulenc Sante, Antony, France

Continuation-in-part of Ser. No. 319,190, Mar. 6, 1989, abandoned. This application Sep. 6, 1989, Ser. No. 403,444
Claims priority, application France, Mar. 8, 1988, 88 02917
Int. Cl.[5] C07D *327/10*
U.S. Cl. 549—34 **1 Claim**

1. 1-Chloromethylethylene sulphate.

4,960,905

PHENOXY PHTHALIC ANHYDRIDES

Willis T. Schwartz, Grand Island, N.Y., assignor to Occidental Chemical Corporation, Niagara Falls, N.Y.

Division of Ser. No. 98,813, Sep. 21, 1987, Pat. No. 4,827,000. This application Dec. 15, 1988, Ser. No. 284,639
Int. Cl.[5] C07D *307/89*
U.S. Cl. 549—243 **17 Claims**

1. 4-(Methoxy-4′-carboxaldehyde phenoxy)phthalic anhydride.
2. 4-(3′-Acetoxyphenoxy)phthalic anhydride.
3. 4-(2′,6′-Dimethylphenoxy)phthalic anhydride.

4,960,906

PROCESS FOR THE PREPARATION OF LACTONES FROM HIGHER ALKENOLS

Eit Drent, Amsterdam, Netherlands, assignor to Shell Oil Company, Houston, Tex.

Filed Apr. 25, 1989, Ser. No. 342,831
Claims priority, application United Kingdom, May 10, 1988, 8811024
Int. Cl.[5] C07D *309/30, 307/32*
U.S. Cl. 549—273 **11 Claims**

1. A process for the preparation of lactones having four or five carbon atoms in the ring or a mixture thereof, which process comprises reacting an alkenol, having the general formula:

wherein n is 0 or an integer from 1 to 25 and wherein Q_1 represents a hydrogen atom or an alkyl group having in the range of from 1 to 30 carbon atoms and wherein Q_2, Q_3, Q_4, Q_5 and Q_6 each independently represent a hydrogen atom or a lower alkyl group having 1 to 4 carbon atoms with the proviso that Q_3 and Q_4 do not represent a lower alkyl

group simultaneously, with a carbon monoxide-containing gas and a catalytic system which comprises:

(a) palladium compound

(b) a bidentate compound selected from the group consisting of phosphine, arsine and stibine, and

(c) a protonic acid having a pK_a less than 2, wherein said catalytic system has a molar ratio of component (a) to said alkenol, in which the hydroxy group is five or more carbon atoms remote from the double bond, of from about 1:10 to about 1:1.000.000, a molar ratio of total phosphorus to component (c) which is lower than about 2, a molar ratio of total phosphorus to component (a) which is in the range of from about 2 to about 400 and a molar ratio of said bidentate compound to component (a) of at least about 1.

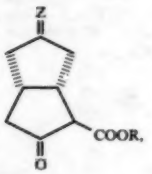
4,960,907

PROCESS FOR THE PRODUCTION OF BICYCLO(3.3.0)OCTANE-3,7-DIONE-2-CARBOXYLIC ACID ESTERS

Helmut Vorbrueggen, and Konrad Krolikiewicz, both of Berlin, Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany

PCT No. PCT/DE88/00011, § 371 Date Jul. 24, 1989, § 102(e) Date Jul. 24, 1989, PCT Pub. No. WO88/05429, PCT Pub. Date Jul. 28, 1988
PCT Filed Jan. 7, 1988, Ser. No. 391,618
Claims priority, application Fed. Rep. of Germany, Jan. 23, 1987, 3702385
Int. Cl.[5] C07D *317/72, 319/08;* **C07C** *69/74, 67/32*
U.S. Cl. 549—336 **4 Claims**

1. A process for the production of D-Lbicyclo[3.3.0]octane-3,7-dione-2-carboxylic acid esters of Formula I

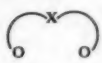


(I)

wherein

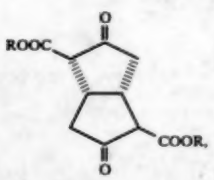
R is methyl or ethyl, and

Z is oxygen or the ketal residue



wherein X means ethylene, trimethylene or 2,2-dimethyltrimethylene,

characterized in that D,L-bicyclo[3.3.0]octane-3,7-dione-2,6-dicarboxylic acid esters of Formula II



(II)

wherein R has the meanings given above,

are partially saponified and decarboxylated in an aqueous or water-containing medium in the presence of acids, and are optionally selectively ketalized.

4,960,908

ISOFLAVONE DERIVATIVES, SALTS THEREOF, AND ONCOSTATIC AND IMMUNOSUPPRESSIVE AGENTS

Noriki Ito, Saitama; Hiroshi Ogawara, Tokyo, and Shunichi Watanabe, Saitama, all of Japan, assignors to Yamanouchi Pharmaceutical Co., Ltd., Tokyo, Japan

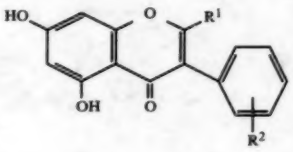
Division of Ser. No. 93,025, Jul. 16, 1987, Pat. No. 4,841,077. This application Oct. 21, 1988, Ser. No. 261,388

Claims priority, application Japan, Nov. 18, 1985, 60-259603

Int. Cl.[5] C07D *311/36*

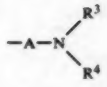
U.S. Cl. 549—403 2 Claims

1. An isoflavone derivative represented by the Formula (I) and salts thereof:



(I)

wherein R^1 represents



in which A denotes a lower alkylene group; R^3 and R^4 are each a hydrogen atom, a lower alkyl, a cycloalkyl or a sulfur- and nitrogen-containing 5-or 6-membered heterocyclic groups, which three groups may optionally be substituted by one or two hydroxyl groups, or R^3 and R^4 may be taken together to form, in conjunction with the nitrogen atom to which they are attached, pyrrolidine, piperidine or morpholine ring; and R^2 is hydroxyl, or a lower alkoxy radical.

4,960,909

7-OXABICYCLO[2.2.1] HEPTANE SULFONAMIDE DERIVATIVES

Masayuki Narisada, Osaka; Mitsuaki Ohtani, Nara; Fumihiko Watanabe, Nara; Sanji Hagishita, Nara; Kaoru Seno; Susumu Kamata, both of Hyogo; Nobuhiro Haga, Osaka; Tatsuo Tsuri, Hyogo; Tadahiko Tsushima, and Kenji Kawada, both of Osaka, all of Japan, assignors to Shionogi & Co., Ltd., Osaka, Japan

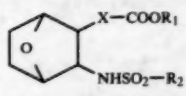
Division of Ser. No. 927,823, Nov. 5, 1986, Pat. No. 4,861,913. This application Mar. 23, 1989, Ser. No. 327,772

Claims priority, application Japan, Nov. 18, 1985, 60-259154; Feb. 13, 1986, 61-30130; May 19, 1986, 61-115599; Jun. 3, 1986, 61-129011; Jul. 17, 1986, 61-169257

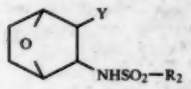
Int. Cl.[5] C07D *307/00*

U.S. Cl. 549—463 3 Claims

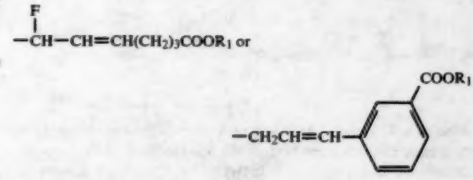
1. A compound represented by the formula:



wherein R_1 is a hydrogen or C_1–C_5 alkyl; R_2 is C_1–C_{10} alkyl, aryl, aralkyl, or pyridyl, where the aryl, aralkyl, or pyridyl are unsubstituted or are substituted by C_1–C_5 alkyl, C_1–C_5 alkoxy, nitro, hydroxy, carboxy, amino, C_1–C_5 alkylamino, C_1–C_5 dialkylamino whose two alkyl groups may be different from each other, C_1–C_3 alkanoylamino, or halogen and X is C_1–C_7 alkylene, C_2–C_7 alkenylene, trimethylenethioethylene, phenyleneoxymethylene or ethylenethiotrimethylene, or its pharmaceutically acceptable salt, or a compound of the formula:



wherein Y is:



and wherein R_1 and R_2 are as defined above, or its pharmaceutically acceptable salt.

4,960,910

OXETANE DERIVATIVES

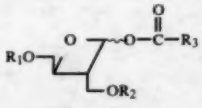
Kuniki Kato, Yono; Tomohisa Takita, Asaka; Shigeru Nishiyama, and Shosuke Yamamura, both of Yokohama, all of Japan, assignors to Nippon Kayaku Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 13, 1989, Ser. No. 365,743

Int. Cl.[5] C07D *305/08*

U.S. Cl. 549—510 3 Claims

1. An oxetane derivative represented by the general formula (I):



(I)

wherein R_1 and R_2 are each an acyl group and R_3 is a hydrogen atom or a lower alkyl group.

4,960,911

PROCESS FOR THE PREPARATION OF OXIRANES

Rudolf Zerbes, Wuppertal, Fed. Rep. of Germany; Siegfried W. Linke, Seoul, Rep. of Korea; Karl H. Mohrmann, and Wolf Reiser, both of Wuppertal, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 603,478, Apr. 24, 1984, abandoned. This application Oct. 28, 1988, Ser. No. 264,463

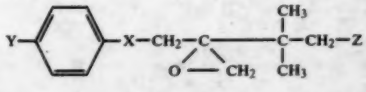
Claims priority, application Fed. Rep. of Germany, Apr. 29, 1983, 3315619

The portion of the term of this patent subsequent to Dec. 30, 2003, has been disclaimed.

Int. Cl.[5] C07D *301/02*

U.S. Cl. 549—519 4 Claims

1. A process for the preparation of an oxirane of the formula



(I)

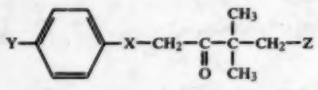
in which

Y represents chlorine

X represents oxygen and
Z represents hydrogen,
which consists contacting, without previous isolation, dimethyl sulphide with dimethyl sulphate in the presence of toluene and contacting the resultant trimethylsulphonium methyl sulphate of the formula

$$(CH_3)_3S\oplus CH_3SO_4^{\ominus} \qquad (II)$$

with a ketone of the formula


(III)

in which X,Y and Z have the meanings indicated above, in the presence of potassium hydroxide powder and in the presence of toluene at a temperature between 10° C. and 40° C. wherein 1.0 to 1.5 moles of said dimethylsulfate, 1.0 to 1.6 moles of said dimethyl sulphide and 1.5 to 2.0 mols of said potassium hydroxide are employed per mole of said ketone and no water is added to the reaction mixture.

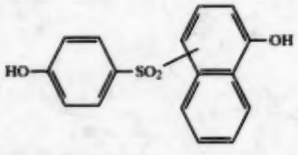
4,960,912

DISSYMMETRIC NEW POLYMER MATERIALS

Kenneth C. Dewhirst, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Division of Ser. No. 255,086, Oct. 7, 1988. This application Jan. 17, 1990, Ser. No. 446,179
Int. Cl.[5] C07D *303/30*; C07C *317/22*
U.S. Cl. 549—556 **2 Claims**

1. A mixture of position isomers having the formula



or the diglycidyl ether thereof.

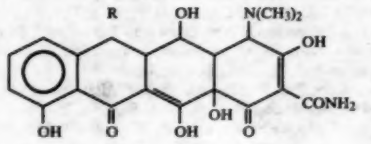
4,960,913

PROCESS FOR THE PREPARATION OF PHARMACEUTICAL COMPOSITIONS

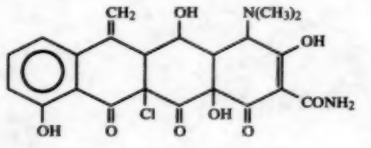
Erzsébet Szalay, Budapest; György Lugosi, Göd-felso; Tamás U. Kállay, Budapest; Zsuzsanna Nád, Budapest; István Jelinek, Budapest; Vilmos Simonidesz, Budapest; Péter Gyory, Budapest; Lajos Nagy, Szentendre; Márta Lugosi, Göd-felso; Ilona Sánta née Singola, Budapest; Gábor Besenyei, Budapest, and László Simándi, Budapest, all of Hungary, assignors to Chinoin Gyogyszer- es Vegyeszeti Termekek Gyara Rt., Budapest, Hungary

PCT No. PCT/HU88/00063, § 371 Date May 5, 1989, § 102(e) Date May 5, 1989, PCT Pub. No. WO89/02429, PCT Pub. Date Mar. 23, 1989
PCT Filed Sep. 16, 1988, Ser. No. 353,657
Claims priority, application Hungary, Sep. 18, 1987, 4164/87
Int. Cl.[5] C07C *237/26*
U.S. Cl. 552—206 **6 Claims**

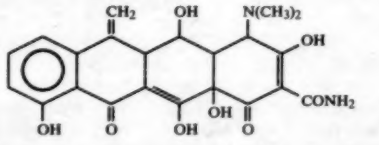
1. Process for the preparation of tetracycline derivatives of the formula


I.

and acid addition salts thereof wherein R stands for —CH_3 by dehalogenating and hydrogenating chloromethacycline or acid addition salts thereof of the formula


II.

or by hydrogenating methacycline or acid addition salts thereof of the formula


III.

by a treatment with hydrogen gas in the presence of a noble metal alloy catalyst on a carrier and an organic solvent which comprises performing hydrogenating under pressure of 0.1–1.0 MPa with an alloy catalyst consisting of either palladium or platinum and selenium, tellurium or a mixture thereof used at a ratio of 1:0.01–0.5 related to the amount of the starting tetracycline and carrying out, if desired dehalogenation and hydrogenation in one step.

4,960,914

METHOD FOR THE PREPARATION OF NAPHTHOQUINONE

Ryohei Minami, Ibaragi, Japan, assignor to Sumitomo Metal Industries, Ltd., Osaka, Japan

Continuation of Ser. No. 751,979, Jun. 28, 1985, abandoned. This application Jan. 19, 1989, Ser. No. 300,695
Claims priority, application Japan, Jun. 29, 1984, 59-135591
Int. Cl.[5] C07C *46/04, 50/12*
U.S. Cl. 552—296 **6 Claims**

1. A method for the preparation of 1,4-naphthoquinone from naphthalene which comprises subjecting naphthalene to vapor phase oxidation at a temperature of not higher than 500° C. in a molecular oxygen-containing atmosphere in the presence of a catalyst comprising an inert carrier and active ingredients supported thereon said catalyst being represented by the formula:

$$(V)_a(K)_b(S)_c(Fe)_d(Sn)_e(X)_f(O)_g$$

where
V, K, S, Fe, Sn and O stand for vanadium, potassium, sulfur, iron, tin and oxygen, respectively;
X stands for at least one element selected from the group of silicon, titanium and aluminum which serves as a carrier in the form of an oxide; and
a, b, c, d, e, f, and g are the atomic fractions of the respective elements wherein the ratio of a:b:c:d:e:f+ 10:10–100:5–30:1–3:0.1–2:10–300 and g is a value depending on the values of a–f and the form of each essential element present in the catalyst.

4,960,915

PROCESS FOR THE PRODUCTION OF LINEAR POLYESTERS, PARTICULARLY FOR FILMS AND FOILS

Ulrich Thiele, Bruchkoebel, Fed. Rep. of Germany, assignor to Davy McKee, AG, Frankfurt, Fed. Rep. of Germany

Filed Feb. 23, 1989, Ser. No. 313,905

Claims priority, application Fed. Rep. of Germany, Apr. 26, 1988, 3814022

Int. Cl.[5] C08K 3/34; C08L 67/02

U.S. Cl. 524—706 8 Claims

1. In a process for producing linear polyesters containing fine particles of an aluminum silicate by reaction of ethylene glycol with a compound selected from aromatic dicarboxylic acids and alkyl esters thereof, the compound consisting essentially of a terephthalic compound, and polycondensation of the reaction mixture, the improvement comprising:

(a) suspending fine particles of an aluminum silicate containing foreign metal atoms in ethylene glycol,

(b) adding to the aluminum silicate suspension an acidic phosphorus compound selected from the group consisting of phosphoric acid, phosphorus acid, a soluble acidic salt and acidic ester thereof, a phosphonic acid and mixtures thereof, in such an amount that the atomic ratio of foreign metal atoms to phosphorus atoms is in the range of 0.1 to 5.0.

(c) adjusting the pH of said suspension to a value in the range of 6.1 to 9.0, measured with a glass electrode, by addition of an alkaline compound selected from the group consisting of alkali hydroxides, alkaline earth hydroxides, triethanolamine, triisopropylamine, tetraethylammonium hydroxide and mixtures thereof, and

(d) adding the suspension of step (c) to the reaction mixture, the addition taking place not later than the beginning of the polycondensation.

4,960,916

ORGANOMETALLIC ANTIMONY COMPOUNDS USEFUL IN CHEMICAL VAPOR DEPOSITION PROCESSES

John C. Pazik, Alexandria, Va., assignor to United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sep. 29, 1989, Ser. No. 415,505

Int. Cl.[5] C07F 9/90, 9/92

U.S. Cl. 556—70 8 Claims

1. A compound having the formula:

$$SbR_nX_{3-n}$$

wherein R is selected from the group consisting of neopentyl, 2-ethylbutyl, 1-ethylpropyl, perhaloalkanes having 3–5 carbon atoms, benzyl, fluoro-substituted phenyl, cyclopentyl, and pentamethylcyclopentadienyl;

X is selected from the group consisting of Br, Cl, I and H; and

n is an integer from 1 to 3.

4,960,917

PROCESS FOR THE PREPARATION OF AN ACEXAMIC ACID DERIVATIVES

Antonio Buxadé, Barcelona, Spain, assignor to Laboratorios Vinas, S.A., Barcelona, Spain

Filed Dec. 22, 1989, Ser. No. 455,638

Claims priority, application Spain, Dec. 26, 1988, 8803957

Int. Cl.[5] C07F 7/06

U.S. Cl. 556—131 5 Claims

1. A process for preparation of an acexamic acid derivative, namely the zinc salt of formula:

$$(CH_3—CONH—(CH_2)_5—COO)_2Zn$$

comprising the step of reacting acexamic acid with zinc hydroxide in a polar solvent.

4,960,918

ORGANIC SILICON COMPOUND HAVING A CINNAMILIDENEAMINOPROPYL GROUP

Hiroki Konno, Annaka; Yasushi Yamamoto, Takasaki, and Shigehisa Sonegawa, Annaka, all of Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

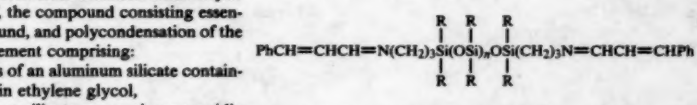
Filed Sep. 21, 1989, Ser. No. 410,352

Claims priority, application Japan, Sep. 22, 1988, 63-238524

Int. Cl.[5] C07F 7/10

U.S. Cl. 556—425 5 Claims

1. An organic silicon compound represented by the general formula (I):



(I)

wherein R is an alkyl group having 1 to 3 carbon atoms, n is an integer of 0 to 10.

4,960,919

PROCESS FOR THE PREPARATION OF ALKYL ALKENYLPHOSPHINATES

Hans-Jerg Kleiner, Kronberg/Taunus, and Günter Roscher, Kelkheim, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

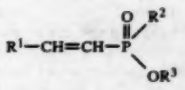
Filed Feb. 16, 1989, Ser. No. 311,527

Claims priority, application Fed. Rep. of Germany, Feb. 19, 1988, 3805205

Int. Cl.[5] C07F 9/40

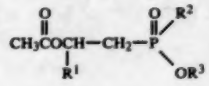
U.S. Cl. 558—142 20 Claims

1. A process for the preparation of alkyl esters of alkenylphosphinic acid, having the general formula I



(I)

wherein R^1 represents H or CH_3, R^2 represents alkyl having from 1 to 4 carbon atoms or phenyl and R^3 represents alkyl having from 1 to 8 carbon atoms, which comprises cleaving an alkyl ester of 2-acetoxyethyl phosphinic acid, having the general formula II



(II)

wherein R^1, R^2 and R^3 have the meaning indicated above, in contact with a liquid, catalytically acting medium and at a partial pressure of the total of the components of the reaction system in the range of from 1 to 500 mbar, and drawing off the resulting alkyl esters of alkenyl phosphinic acid and other volatile reaction products.

4,960,920

PROCESS FOR THE PREPARATION OF α-AMINOALKYLPHOSPHONIC ACIDS AND OF α-AMINOALKYLPHOSPHINIC ACIDS

Günter Bartels, Braunschweig, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt an Main, Fed. Rep. of Germany

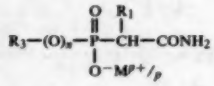
Continuation of Ser. No. 75,248, Jul. 16, 1987, abandoned, which is a continuation of Ser. No. 807,455, Dec. 10, 1985, abandoned. This application May 2, 1989, Ser. No. 348,144

Claims priority, application Fed. Rep. of Germany, Dec. 12, 1984, 3445300

Int. Cl.[5] C07F *9/40, 9/46*

U.S. Cl. 558—170 12 Claims

1. A compound of formula II



(II)

wherein

n is 1 or 0,

R_1 is H, CH_3 or CH_2–C_6H_5,

R_3 is C_1–C_8-alkyl when n is 1, and C_1–C_8-alkyl or phenyl when

n is 0, and

M^{p+} is Na^+ or K^+.

4,960,921

MULTIPLY PROMOTED MN-SB OXIDE CATALYSTS

Dev. D. Suresh, Macedonia; Robert K. Grasselli, Aurora; Frances I. Ratka, Cleveland Heights, and James F. Brazdil, Mayfield Village, all of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Division of Ser. No. 904,587, Sep. 8, 1986, which is a continuation-in-part of Ser. No. 569,425, Jan. 9, 1984, abandoned, which is a continuation-in-part of Ser. No. 340,910, Jan. 20, 1982, abandoned, which is a continuation-in-part of Ser. No. 190,532, Sep. 24, 1980, abandoned. This application Feb. 12, 1990, Ser. No. 478,382

Int. Cl.[5] C07C *253/26*

U.S. Cl. 558—325 4 Claims

1. In an ammoxidation process in which oxygen, ammonia and a reactant selected from the group consisting of propylene and isobutylene in the vapor phase are contacted with a catalyst at elevated temperatures and a pressure of 14 or less atmospheres, the improvement wherein said catalyst comprises a manganese antimonate oxide complex of the formula:

$$A_aD_bC_cMn_dSb_{12}O_x$$

wherein

A is at least one of Cu, Ag, V, W and/or Mo;

D is Te and/or Cr;

C is optional elements selected from Ce, La, Mg, Ca, Co, Ni, Nb, Ta, Zn, Cd, K, Cs, B, P and/or Eu; and

wherein

a is 0.5 to 5;

b is 0.1 to 2;

c is 0 to 10;

d is 2.4 to 10; and

x is determined by the valence requirements of the other elements present, and

wherein A is selected so that said oxide complex at least contains Cu and at least one of Mo and W, and further wherein said oxide complex is substantially free of Fe, U, and Sn.

4,960,922

PROCESS TO DEHYDROHALOGENATE ESTERS OF PENTAHALOPROPYLDIMETHYLCYCLOPROPANECARBOXYLIC ACIDS USING A CATALYTIC AMOUNT OF 1,8-DIAZABICYCLO[(5.4.0]UNDECENE-7-ENE IN COMBINATION WITH STOICHIOMETRIC AMOUNTS OF BASE

John H. Hoare, Hamilton Square, N.J., assignor to FMC Corporation, Philadelphia, Pa.

Filed Mar. 15, 1989, Ser. No. 323,652

Int. Cl.[5] C07C *67/317*

U.S. Cl. 560—124 11 Claims

1. Process for the preparation of esters of cis or trans-3-[2-(E/Z)-halo-3,3,3-trihalo-1-propenyl]-2,2-dimethylcyclopropanecarboxylic acid, or mixtures thereof, which comprises dehydrohalogenating the corresponding esters of cis or trans-3-(2,2-dihalo-3,3,3-trihalopropyl)-2,2-dimethylcyclopropanecarboxylic acid, or said mixtures, with a catalytic amount of a cyclic amidine selected from 1,8-diazabicyclo[5.4.-0]undec-7-ene,1.5-diazabicyclo[4.3.0]non-5-ene, or mixtures thereof, in the presence of an alkali or alkaline earth metal base, or combinations thereof, and a polar aprotic solvent under essentially anhydrous conditions.

4,960,923

PURE CRYSTALLINE METHYL 2-ACRYLOYLAMINO-2-METHOXY ACETATE AND A PROCESS FOR PREPARING IT

Yani Christidis, Paris, and Christian Sidot, Ezanville, both of France, assignors to Societe Francaise Hoechst, Puteaux, France

Filed Nov. 2, 1988, Ser. No. 266,485

Claims priority, application France, Nov. 4, 1987, 87 15291

Int. Cl.[5] C07C *103/66*

U.S. Cl. 560—170 2 Claims

1. A process for the preparation of pure crystalline methyl 2-acryloylamino-2-methoxyacetate by reacting pure crystalline anhydrous acrylamidoglycolic acid in an anhydrous medium with methanol in the presence of hydrogen chloride, subsequently neutralizing the reaction medium with an alkaline metal bicarbonate, then filtering off the mineral salts, and finally isolating said pure crystalline methyl 2-acryloylamino-2-methoxyacetate by distillation with 1,1,1-tricholoroethane under vacuum and crystallization in 1,1,1-trichloroethane.

4,960,924

MERCAPTOALKYL ACETOACETATES

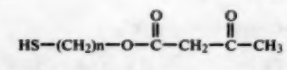
Daniel A. Bors, Warminster, and William D. Emmons, Huntingdon Valley, both of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Filed Oct. 31, 1988, Ser. No. 265,185

Int. Cl.[5] C07C *149/20*

U.S. Cl. 560—178 2 Claims

1. A compound of the formula



wherein n is 1 to 8.

4,960,925

ALKYL MONOPEROXYSUCCINIC ACID PRECURSORS AND METHOD OF SYNTHESIS

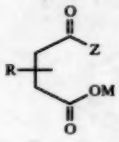
Dale S. Steichen, Livermore; Hao Ku, Pleasanton, and Sheldon N. Lewis, Lafayette, all of Calif., assignors to The Clorox Company, Oakland, Calif.

Division of Ser. No. 897,152, Aug. 14, 1986, Pat. No. 4,790,952. This application Oct. 24, 1988, Ser. No. 261,709

Int. Cl.[5] C07C *69/40, 67/08;* C07D *233/66*

U.S. Cl. 560—193 44 Claims

1. A compound of the structure:



wherein

Z is a leaving group, the conjugate acid of which has a pKa in the range of from about 4 to about 15;

R is a substituted or unsubstituted, alkyl or alkenyl group having from about one to eighteen carbon atoms and wherein substituents of R include SO_3, CO_2, NO_3, ammonium and halogen; and

M is hydrogen or an alkali or alkaline earth metal.

4,960,926

PROCESS FOR THE CARBONYLATION OF OLEFINICALLY UNSATURATED COMPOUNDS WITH A PALLADIUM CATALYST

Eit Drent, Amsterdam, Netherlands, assignor to Shell Oil Company, Houston, Tex.

Continuation of Ser. No. 123,516, Nov. 20, 1987, abandoned. This application Jul. 27, 1989, Ser. No. 386,035

Claims priority, application Netherlands, Dec. 24, 1986, 8603302

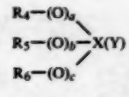
Int. Cl.[5] C07C *67/38*

U.S. Cl. 560—233 27 Claims

1. A process for the carbonylation of olefinically unsaturated compounds which comprises reacting at a temperature in the range of 50° C. to 200° C. and a pressure in the range of 1 bar to 100 bar said olefinically unsaturated compounds with carbon monoxide and a hydroxyl-group-containing selected from the group consisting of water, alcohols, carboxylic acids and mixtures thereof to form the corresponding carboxylic acids, esters or carboxylic acid anhydrides in the presence of a palladium catalyst, an organic phosphine according to the formula:

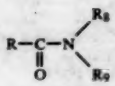
(I)

where R_1, R_2 and R_3 each represent an optionally substituted aryl group, an acid with a pKa value <2, with the exception of halogen acids and carboxylic acids, as promoter, and a catalyst stabilizer selected from the group consisting of compounds of the general formula:



(II)

wherein X represents an element of Group VA with a valency greater than 3, selected from the group consisting of P, As and Sb, wherein Y represents an element of Group VIA selected from the group consisting of O, S and Se, and wherein, a, b and c are 0 or 1 and R_4, R_5 and R_6 are the same or different and represent substituted or unsubstituted hydrocarbon groups, a and b=0 and c=0 or 1 and R_4 and R_5 together with X form a heterocyclic group, or, a, b and c=0 and R_4, R_5 and R_6 together with X form a heterocyclic group, compounds of the general formula:



(III)

wherein R_7 is a hydrocarbon group and R_8 and R_9 are each the same or different and have the aforesaid meaning of R_7, R_8 and R_9 together with N form a heterocyclic ring, or, R_7 and R_8 or R_9 together with the residue

form a heterocyclic ring and mixtures of compounds represented by formula (II) and (III).

4,960,927

PROCESS FOR THE CONTINUOUS PREPARATION OF ACETATES

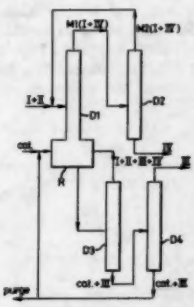
Michel Canonge, Martigues, and Jean C. Joly, Marseille, both of France, assignors to BP Chemicals Limited, London, England

Continuation of Ser. No. 157,738, Feb. 18, 1988, abandoned. This application Dec. 5, 1989, Ser. No. 449,516

Claims priority, application France, Feb. 23, 1987, 87 02454

Int. Cl.[5] C07C *67/02*

U.S. Cl. 560—234 8 Claims



1. A process for the continuous preparation of acetates by a catalytic transesterification reaction using an acetate (I) having the formula

CH_3COOR_1

wherein R_1 is an alkyl radical comprising 1–4 carbon atoms, with an alcohol (II) having the formula

R_2OH

wherein R_2 is either an alkyl radical comprising at least 4 carbon atoms, or a radical having the formula $R_3(OCH_2CHR_4)_n$, Wherein R_3 is an alkyl radical comprising 1–4 carbon atoms, R_4 is a hydrogen atom or a methyl radical and n is an integer from 1 to 4, and leading to the formation of an acetate (III) having the formula

CH_3COOR_2

and of an alcohol (IV) having the formula

R_1OH

the reaction being performed in the homogeneous liquid phase in the presence of a catalyst selected from metallic alcoholates, the process being characterised in that:

(a) the catalyst is introduced into a reactor (R) kept at a temperature of from 100° to 200° C. under an absolute pressure (P1) from 0.1 to 1 MPa,

(b) the acetate (I) and the alcohol (II) are introduced into a distillation column (D1) connected via its lower portion to the upper portion of the reactor (R) and operating under a pressure substantially identical with that in the reactor (R),

(c) at the head of the column (D1) an azeotropic mixture (M1) is separated which is formed by the acetate (I) and the alcohol (IV), the mixture being supplied to a distillation column (D2) operating under an absolute pressure (P2) lower than (P1),

(d) the alcohol (IV) is separated at the bottom of the column (D2) and a new azeotropic mixture (M2) is separated at the head of the column which is formed by the acetate (I) and the alcohol (IV) and has an alcohol (IV) content lower than that of the mixture (M1), the new mixture (M_2) then being recycled to the column (D1), and

(e) a mixture is withdrawn from the reactor (R) which mainly comprises the catalyst and the acetate (III), which is separated and purified, the catalyst being recycled to the reactor (R).

4,960,928

1-HYDROXY-OMEGA-(ALKYL- OR ARYLPHOSPHINICO)ALKANE-1,1-DIPHOSPHONIC ACIDS, SALTS THEREOF, AND PROCESSES FOR THE PREPARATION OF THESE COMPOUNDS

Werner Klose, Erftstadt, and Helmut Klemp, Kerpen, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft Knapsack, Hurth Knapsack, Fed. Rep. of Germany

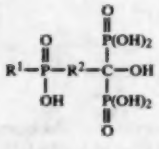
Filed Feb. 9, 1989, Ser. No. 308,840

Claims priority, application Fed. Rep. of Germany, Feb. 24, 1988, 3805644

Int. Cl.[5] C07F *9/38*

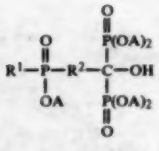
U.S. Cl. 562—21 **1 Claim**

1. A 1-hydroxy-ω-(alkyl- or arylphosphinico)alkane-1,1diphosphonic acid of the formula I



I

or a salt of this acid of the formula II



where, in these formulae, R^1 denotes an alkyl radical having 1 to 6 carbon atoms, a cycloalkyl radical having to 7 carbon atoms or an aryl radical having 6 to 10 carbon atoms, R^2 denotes a straight-chain or branched alkylene radical having 1 to 6 carbon atoms and A denotes a monovalent equivalent of a cation of an inorganic or organic base.

4,960,929

HYDROXYETHYLSULFONYLNITRO- AND HYDROXYETHYLSULFONYLAMINO-BENZOIC ACIDS AND PROCESSES FOR THEIR PREPARATION

Theodor Papenfuhs, Frankfurt am Main, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

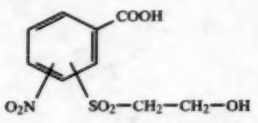
Filed Oct. 13, 1988, Ser. No. 257,741

Claims priority, application Fed. Rep. of Germany, Oct. 17, 1987, 3735268

Int. Cl.[5] C07C *147/13*

U.S. Cl. 562—430 **1 Claim**

1. A compound of the formula



in which the nitro and hydroxyethylsulfonyl group are in the ortho- or para-position relative to one another.

4,960,930

PROCESS FOR PURIFICATION AND RECOVERY OF L-PHENYLALANINE

Jong S. Kim; Min S. Han; Bun S. Lim; Gae C. Lee, and Seung T. Lee, all of Seoul, Rep. of Korea, assignors to Miwon Co., Ltd., Seoul, Rep. of Korea

Filed Oct. 19, 1989, Ser. No. 423,887

Int. Cl.[5] C07C *227/40*

U.S. Cl. 562—443 **8 Claims**

1. A process for purification and recovery of phenylalanine from fermented broth of phenylalanine, which comprises the steps of:

(a) adding zinc salt to said fermentation broth and adding an alkali compound to said fermentation broth to adjust the pH of said mixture to 7–9 to produce zinc salt of phenylalanine in a crystalline form;

(b) recovering said zinc salt to phenylalanine in the crystalline form;

(c) adding acid to said zinc salt to phenylalanine in the crystalline form with water to adjust the pH to 4–7 to dissociate said zinc salt of phenylalanine to produce a solution containing phenylalanine and zinc ion; and

(d) separating the phenylalanine from said solution of said step (c).

4,960,931

GABAPENTIN MOHOHYDRATE AND A PROCESS FOR PRODUCING THE SAME

Donald E. Butler, Holland, and Barbara J. Greenman, Door, both of Mich., assignors to Warner-Lambert Company, Morris Plains, N.J.

Division of Ser. No. 188,819, May 2, 1988, Pat. No. 4,894,476. This application Oct. 6, 1989, Ser. No. 417,995

Int. Cl.[5] C07C *61/08*

U.S. Cl. 562—507 **7 Claims**

1. A process for the preparation of a compound of formula

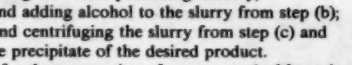
II

which comprises:

(a) pouring a solution of an acid salt of (1-aminomethyl)-cyclohexaneacetic acid in deionized water onto an ion exchange column in the basic form and eluting the column with deionized water;

(b) concentrating the eluate producing a slurry;
(c) cooling and adding alcohol to the slurry from step (b);
(d) cooling and centrifuging the slurry from step (c) and
(e) drying the precipitate of the desired product.

7. A process for the preparation of a compound of formula



I

which comprises:
(a) dissolving pure gabapentin monohydrate in methanol;
(b) diluting and cooling the solution from step (a) producing a slurry;
(c) centrifuging the slurry from step (b) and drying the precipitate formula above.

4,960,932

PROCESS FOR PREPARING AN AQUEOUS SOLUTION OF AN ALKALI METAL SALT OF METHIONINE

Claude Gillonnier, Neris-les-Bains, and René Moisson, Montlucon, both of France, assignors to A.E.C., Commentry, France

Continuation of Ser. No. 936,393, Dec. 1, 1986, abandoned. This application Oct. 3, 1988, Ser. No. 251,854

Claims priority, application France, Dec. 3, 1985, 85 17847

Int. Cl.[5] C07C *149/247*

U.S. Cl. 562—559 **2 Claims**

1. Process for preparing a solution of sodium or potassium methioninate having a concentration, expressed as methionine, of 30 to 60% by weight and suitable for direct use as an additive in feeding livestock, which comprises hydrolysing 4-methylmercapto-2-aminobutyronitrile in the presence of hydroxide ions and acetone, removing the acetone, and hydrolysing the 4-methylmercapto-2-aminobutyramide obtained at a temperature of 100° C. to 180° C. with an aqueous solution of sodium or potassium hydroxide in a proportion of 0.9 to 1.1 mole per mole of the said amide, the initial concentration of said 4-methylmercapto-2-aminobutyramide being such that the methionine content of the solution of sodium or potassium methioninate obtained is between 30 and 60% by weight, and removing the ammonia formed, to produce the said solution of sodium or potassium methioninate free from inorganic salts and from unhydrolysed amide.

4,960,933

BORON TRIS-(DIALKYL-DITHIOCARBAMATES) AND A PROCESS FOR THEIR PREPARATION

Wolfram Spiess, and Rolf Himmelreich, both of Grünstadt, Fed. Rep. of Germany, assignors to C. F. Spiess & Sohn GmbH & Co., Kleinkarlbach, Fed. Rep. of Germany

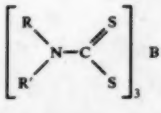
Division of Ser. No. 186,337, Apr. 26, 1988,. This application Aug. 28, 1989, Ser. No. 399,675

Claims priority, application Fed. Rep. of Germany, Apr. 29, 1987, 3714260

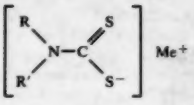
Int. Cl.[5] C07F *5/02*

U.S. Cl. 562—882 **11 Claims**

1. A process for preparing a boron tris-(dialkyl-dithiocarbamate) of the formula



wherein R and R' represent the same or different branched- or straight-chain saturated or unsaturated hydrocarbon groups having from 1 to 16 carbon atoms, comprising reacting 3 moles of an alkali dialkyl-dithiocarbamate of the formula



wherein Me^+ represents Na^+, K^+ or NH_4^+, with one mole of boron tribromide, boron trichloride or boron trifluoride, separating the so-formed alkali metal or ammonium halide and isolating the boron tris-(dialkyl-dithiocarbamate).

4,960,934

AMINE OXIDE PROCESS

Kim R. Smith, and Joe D. Sauer, Baton Rouge, La., assignors to Ethyl Corporation, Richmond, Va.

Filed Oct. 27, 1989, Ser. No. 427,780

Int. Cl.[5] C07C *135/02*

U.S. Cl. 564—298 **22 Claims**

1. In a process for making a tert-amine oxide by the reaction of a tert-amine capable of forming an amine oxide with aqueous hydrogen peroxide, the improvement comprising conducting said reaction in the presence of a promoter amount of ammonium carbonate, ammonium bicarbonate or ammonium carbamate or mixtures thereof as a catalyst whereby the reaction rate is increased.

13. A process for making a trialkylamine oxide dihydrate, said process comprising reacting a tert-amine having the formula $R^4R^5R^6N$ wherein R^4, R^5 and R^6 are independently selected from primary alkyls containing 1–30 carbon atoms, primary aralkyls containing 7–12 carbon atoms, hydroxyalkyls containing 2–4 carbon atoms and tert-amines wherein any two of R^4, R^5 or R^6 taken together form a morpholine or piperidine ring, with an aqueous hydrogen peroxide containing 50–90 weight percent active H_2O_2 at a temperature of about 20° C. up to about 100° C., in the presence of a promoter amount of ammonium carbonate, ammonium bicarbonate or ammonium carbamate or mixtures thereof, at least part of said reaction being conducted in an organic solvent selected from organic esters, liquid aliphatic hydrocarbons containing 6–20 carbon atoms, aromatic hydrocarbons containing 6–8 carbon atoms, cycloaliphatic hydrocarbons containing 6–8 carbon atoms, aromatic halohydrocarbons containing 6–8 carbon atoms, dimethylformamide, diethylformamide, dimethylacetamide, diethyl acetamide and mixtures thereof, said solvent being present in an amount that maintains a fluid stirrable reaction mixture and, if necessary, distilling water from or adding water to said reaction mixture to achieve a water/tert-amine oxide ratio of about 1.9–2.1/1.0 and recovering said tert-amine oxide dihydrate from said reaction mixture.

4,960,935

BISPHENOL DERIVATIVES, PROCESS FOR THEIR MANUFACTURE, AND THEIR USE AS SURFACTANTS

Erwin Dietz, Kelkheim; Erich Hoffmann, Kriftel, and Joachim Weide, Kelkheim, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

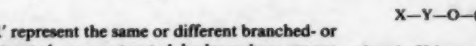
Continuation of Ser. No. 281,341, Jul. 8, 1981, abandoned. This application Mar. 23, 1983, Ser. No. 477,837

Claims priority, application Fed. Rep. of Germany, Jul. 10, 1980, 3026127

Int. Cl.[5] C07C *93/06*

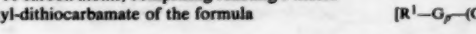
U.S. Cl. 564—325 **8 Claims**

1. A compound of the general formula



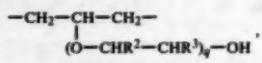
(I)

wherein X is a radical of the general formula



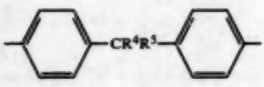
(Ia)

in which R^1 is a saturated aliphatic radical of from 6 to 30 carbon atoms or an unsaturated aliphatic radical having one or several ethylenic bonds and being of from 6 to 30 carbon atoms, G is phenylene or naphthylene, p is zero or 1, R^2 and R^3 are hydrogen or methyl, but are not both methyl, and n is a number from 1 to 15, Y is a radical of the formula



(1b)

in which R^2 and R^3 have the indicated meanings and q represents identical or different numbers from 10 to 100, A is a radical of the general formula



(1c)

in which R^4 and R^5 are hydrogen or alkyl of from 1 to 3 carbon atoms, and m is a number from zero to 5.

4,960,936

PROCESS FOR THE PREPARATION OF HALOGENATED AROMATIC PRIMARY AMINES

Peter Baumeister, Flüh, and Wilfried Scherrer, Bubendorf, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Dec. 19, 1988, Ser. No. 286,102

Claims priority, application Switzerland, Dec. 31, 1987, 5126/87

Int. Cl.[5] C07C *209/36*

U.S. Cl. 564—417 **20 Claims**

1. A process for the preparation of halogenated aromatic primary amines by catalytic hydrogenation of halogenated aromatic nitro compounds in the presence of Raney nickel at a pressure of 0.1 to 100 bar and at a temperature of 30° to 150° C. in an inert solvent and in the presence of an inhibitor against dehalogenation, wherein the inhibitor is a formamidine salt.

4,960,937

PROCESS FOR THE PREPARATION OF TRANS-1,1,2-TRIPHENYL-BUT-1-ENE DERIVATIVES

Axel Woschina, Poing, and Helmut Grill, Vaterstetten, both of Fed. Rep. of Germany, assignors to Klinge Pharma GmbH, Munich, Fed. Rep. of Germany

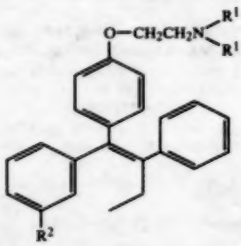
Filed Oct. 27, 1988, Ser. No. 263,209

Claims priority, application Fed. Rep. of Germany, Oct. 29, 1987, 3736682

Int. Cl.[5] C07C *213/08*

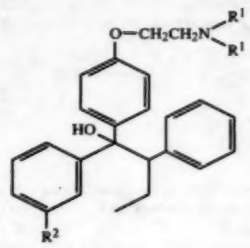
U.S. Cl. 564—324 **7 Claims**

1. A process for the preparation of trans-1,1,2-triphenyl-but-1-ene derivatives having the general formula 1



1

in which R^1=CH_3, CH_2CH_3 and R^2=H, OH, wherein carbinols having the general formula 2



2

in which R^1 and R_2 possess the meaning which is given in formula 1 are heated for 10–16 hours at a temperature of from 50°–60° C. in a strongly hydrochloric of sulphuric acid medium with the exclusion or organic solvents and wherein the reaction product is recovered by conventional methods.

4,960,938

PREPARING 2-CHLOROBENZYLAMINE FROM 2-CHLOROBENZYLCHLORIDE VIA 2-CHLOROBENZYLPHTHALIMIDE

Neil J. O'Reilly, Grand Island; Stanley A. Sojka, Buffalo, and Henry C. Lin, Grand Island, all of N.Y., assignors to Occidental Chemical Corporation, Niagara Falls, N.Y.

Filed Nov. 2, 1988, Ser. No. 265,979

Int. Cl.[5] C07C *211/27*

U.S. Cl. 564—366 **14 Claims**

1. A method for preparing 2-chlorobenzylamine, said method comprising the steps of:

(a) reacting 2-chlorobenzylchloride with alkali metal phthalimide at a temperature ranging from about 60° C. to the reflux temperature to form 2-chlorobenzylphthalimide, and

(b) cleaving the phthalimide ring of 2-chlorobenzylphthalimide to form 2-chlorobenzylamine.

4,960,939

PROCESS FOR THE PREPARATION OF 3,4-DI-METHOXY-N-METHYL-PHENETHYLAMINE

Maire M. Eloranta, Oulu, Finland, assignor to Farmos-Yhtyma Oy, Turku, Finland

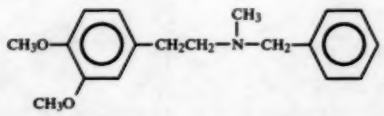
Filed Jun. 13, 1984, Ser. No. 620,288

Claims priority, application Finland, Jun. 14, 1983, 832128

Int. Cl.[5] C07C *87/28*

U.S. Cl. 564—374 **2 Claims**

1. A process for producing a compound of formula II



(II)

which comprises reacting 3,4-dimethoxyphenethylamine with a mixture of benzaldehyde and formaldehyde in the presence of hydrogen and a catalyst to give a compound of formula (II).

4,960,940

BIS(HYDROXYETHYLSULFONYLMETHYL)ANILINES AND A PROCESS FOR THEIR PREPARATION

Theodor Papenfuhs, Frankfurt am Main, and Josef Geisenberger, Kelkheim, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

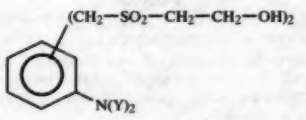
Filed Sep. 29, 1988, Ser. No. 251,469

Claims priority, application Fed. Rep. of Germany, Oct. 3, 1987, 3733504

Int. Cl.[5] C07C *317/26*

U.S. Cl. 564—440 9 Claims

9. A compound of the formula



in which Y denotes a hydrogen or oxygen atom, the two side chains $—CH_2—SO_2—CH_2—CH_2—OH$ are in the ortho-, meta- or para-position relative to one another, and the $N(Y)_2$ group is in the 4-position in the case where the two side chains mentioned are in the 1,2- or 1,3-position.

4,960,941

HYDROGENATION OF AROMATIC AMINES TO PRODUCE THEIR RING HYDROGENATED COUNTERPARTS

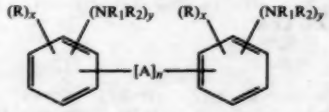
Gamini A. Vedage, Bethlehem; William W. Henderson; Bernard A. Toseland, both of Allentown, and Michel Deeba, North Brunswick, all of N.J., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Mar. 30, 1988, Ser. No. 175,444

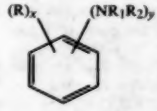
Int. Cl.[5] C07C *209/70*

U.S. Cl. 564—450 29 Claims

1. In a process for the catalytic hydrogenation of aromatic amines to their ring hydrogenated counterparts by contacting the aromatic amine with hydrogen in the presence of a rhodium catalyst, the improvement which comprises effecting said hydrogenation with a catalyst comprising rhodium supported on titania wherein the aromatic amine is represented by the formulas:

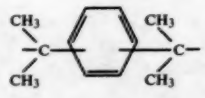


I



II

wherein R is hydrogen or C_{1-6} aliphatic, R_1 and R_2 are hydrogen or C_{1-6} aliphatic, A is C_{1-4}, NH or



n is 0–2, x is 1–3 and y is 1 to 2 except the sum of the y groups in Formula I may be 1.

4,960,942

PROCESS FOR THE MANUFACTURE OF N-(POLYOXYALKYL)-N-(ALKYL)AMINES

Richard M. Gerkin, Cross Lanes, and David L. Kirchner, South Charleston, both of W. Va., assignors to Union Carbide Chemicals and Plastics Company Inc., Danbury, Conn.

Filed May 17, 1988, Ser. No. 195,010

Int. Cl.[5] C07C *85/06*

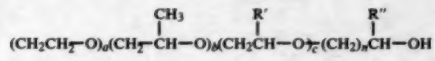
U.S. Cl. 564—479 15 Claims

1. A process for the manufacture of N-(polyoxyalkyl)-N-(alkyl)amines of the general formula:

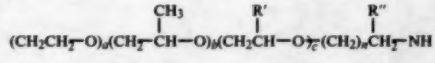
$R[X]_{(hz)}[(Y)_p(Z)_x(T)_t]_{2-(hz)}$

wherein: R is an initiator radical based on a compound containing Zerewitinoff active hydrogen atoms.

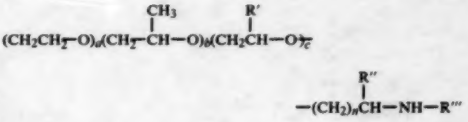
"X" is a group represented by the formula:



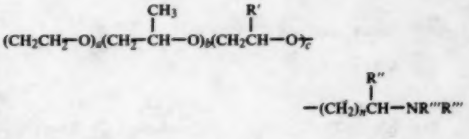
"Y" is the group represented by the formula:



"Z" is a group represented by the formula:



"T" is a group represented by the formula:



a is 0 to 175,
b is 0 to 175,
c is 0 to 30,
n is 1 to 3,
a+b+c is equal to or greater than 2 when n is 1,
R' is an alkyl group containing from two carbon atoms to eighteen carbon atoms,
R'' is hydrogen or an containing up to eighteen carbon atoms,
R''' is a secondary or tertiary alkyl or group containing from three to eighteen carbon
R'''' is an alkyl or aryl group containing to twelve carbon atoms,
h is 0 to 0.7,
p is 0 to 0.4,
s is 0.5 to 1.0,
t is 0 to 0.15,
p+s+t =1.0, and
z is 1 to 6,

which process comprises reacting an alcohol of the formula: R'''OH

wherein R''' is as defined above, with a polyetheramine having a molecular weight of at least and a primary amine content, relative to the total amine content, of at least 50 percent, said process being carried out at a temperature of from 175° to 250° C. and a pressure of 250 to 2000 psi in the presence of hydrogen and a catalyst.

4,960,943

PROCESS FOR THE PREPARATION OF PHENYLKETONES ETHERIFIED IN THE 4-POSITION

Artur Botta; Hans-Josef Buysch, both of Krefeld; Lothar Puppe, Burscheid, and Dieter Arlt, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

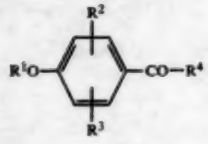
Filed Mar. 2, 1989, Ser. No. 318,088

Claims priority, application Fed. Rep. of Germany, Mar. 19, 1988, 3809260

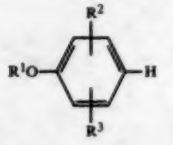
Int. Cl.[5] C07C 45/46

U.S. Cl. 568—319 18 Claims

1. A process for the preparation of phenylketones etherified in the 4-position of the formula



by reaction or aromatic ethers of the formula



with acylating agents of the formula

$$X—CO—R^4$$

in which formulae

R^1 stands for C_1–C_{12}-alkyl, C_2–C_{12}-alkenyl, C_3–C_7-cycloalkyl or C_6–C_{10}-aryl,

R^2 and R^3 independently of one another denote hydrogen, fluorine, chlorine, bromine, C_1–C_4-alkyl or C_3–C_7-cycloalkyl,

R^4 denotes C_1–C_{16}-alkyl, C_2–C_{16}-alkenyl, C_3–C_7-cycloalkyl, C_7–C_{12}-aralkyl, C_8–C_{12}-aralkenyl or C_6–C_{12}-aryl and

X stands for chlorine, bromine, $OCOR^4$, C_1–C_4-alkoxy, hydroxyl, amino, NH—C_1–C_4-alkyl or $N(C_1$–C_4-alkyl$)_2$

wherein the reactants to be reacted are present in the liquid phase and the acylation reaction is carried out in the presence of zeolite catalysts of the formula

$$M_{n/z}[mMe^1{}_2O_2 \cdot nMe^2O_2] \cdot q\ H_2O,$$

in which

M is an exchangeable cation,

z is the valence of the cation,

Me^1 and Me^2 represent the elements of the anionic skeleton,

n/m denotes the ratio of the elements and adopts values of 1–3000, and

q denotes the amount of the water absorbed; the zeolites having pore sizes of at least 5 Å and the zeolites used are those of the structures faujasite, L, mordenite, mazzite, offretite, gmelinite, cancrinite, ZSM 12, ZSM 25, zeolite β, ferrierite, ZSM 5, ZSM 11, heulandite, ZSM 22, ZSM 23, ZSM 48, ZSM 43, ZSM 35, PSH-3, zeolite ρ, ZSM 38, CSZ-1, ZSM 3, ZSM 20, chabasite.

4,960,944

TETRALIN OXIDATION

Robert J. Small, Satsuma, Ala., assignor to Wesley II Limited Partnership, Montrose, Ala.

Filed Jul. 19, 1989, Ser. No. 381,869

Int. Cl.[5] C07C 45/34

U.S. Cl. 568—321 15 Claims

1. A process for the liquid-phase oxidation of tetralin to tetralone which comprises contacting tetralin under oxidation conditions with gaseous oxygen in the presence of a catalyst comprising copper hydroxide having low organic and water solubility.

4,960,945

PROCESS FOR THE PRODUCTION OF HALOBENZOPHENONE DERIVATIVES

Takashi Terauchi, Kasukabe; Kazuo Yoshida; Yoshihisa Machida, both of Iwaki; Nobuyuki Okubo, Urawa, and Yutaka Konai, Machida, all of Japan, assignors to Kureha Kagaku Kogyo K.K., Japan

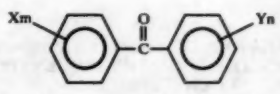
Filed Jul. 13, 1989, Ser. No. 379,388

Claims priority, application Japan, Jul. 28, 1988, 63-186788

Int. Cl.[5] C07C 45/27

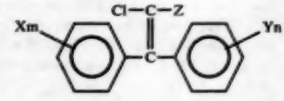
U.S. Cl. 568—323 2 Claims

1. A process for the production of a halobenzophenone derivative represented by the following formula (II):



(II)

wherein X and Y are the same or different and are independently F, Cl, Br or I, m stands for an integer of from 1 to 4 and n stands for an integer of from 0 to 4, which comprises oxidizing a compound with an aqueous nitric acid solution having a specific gravity in a range of from 1.32 to 1.47 as measured at 20° C., and in the substantial absence of an organic solvent said compound being represented by the following formula (I):



(I)

wherein X, Y, m and n have the same meanings as defined above and Z is Cl or H.

4,960,946

SANDALWOOD ODORANTS

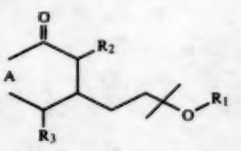
Robert Ellerman, Merrick, N.Y.; Philip Christenson, Midland Park; John Yurecko, Jr., Dayton, and Thomas Zebovitz, Colonia, all of N.J., assignors to BASF K&F, Parsippany, N.J.

Division of Ser. No. 285,782, Dec. 16, 1988, Pat. No. 4,891,447. This application Oct. 13, 1989, Ser. No. 421,266

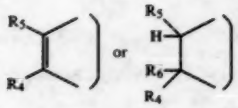
Int. Cl.[5] C07C 49/403, 49/603

U.S. Cl. 568—376 5 Claims

1. A compound having the structure



wherein A is



and where R_1 is methyl or ethyl, R_2–R_6 are independently hydrogen or methyl with the proviso that a maximum of two of the substituents R_2–R_6 are methyl.

4,960,947

PROCESS FOR PRODUCING HEXAFLUOROACETONE OR ITS HYDRATE

Takehiro Sonoi; Toshimasa Sagawa; Okimasa Yamada, and Tetsuya Mizuno, all of Kitaibaraki, Japan, assignors to Nippon Mektron Limited, Tokyo, Japan

Continuation of Ser. No. 189,034, May 2, 1988, Pat. No. 4,885,398. This application Jun. 28, 1989, Ser. No. 372,531

Int. Cl.[5] C07C *45/37*

U.S. Cl. 508—399 **6 Claims**

1. A process for producing hexafluoroacetone or its hydrate, which comprises thermally decomposing an octafluoroisobutyl lower alkyl, phenyl or benzyl ether in the presence of oxygen and an activated carbon catalyst at a temperature of 50° to 600° C.

4,960,948

MANUFACTURE OF KETONE DERIVATIVES OF POLYOXYPROPYLENE GLYCOLS

John R. Sanderson, Leander, and Edward T. Marquis, Austin, both of Tex., assignors to Texaco Chemical Company, White Plains, N.Y.

Filed Dec. 26, 1989, Ser. No. 456,891

Int. Cl.[5] C07C *45/30*

U.S. Cl. 568—405 **13 Claims**

1. A method of making a polyoxypropylene diketone having an average molecular weight of about 200 to about 3,000 which comprises:

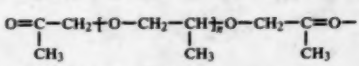
initially adding predetermined amounts of glacial acetic acid, a polyoxypropylene glycol and, optionally, water, to a reaction zone and thereafter adding an aqueous solution of an alkali metal or an alkaline earth metal hypochlorite oxidant to the reaction zone with agitation under reaction conditions including a temperature of about 10° to about 50° C., a pressure of about 0 to 1,000 psig. and a total reaction time of about 0.5 to 20 hours, whereby said polyoxypropylene glycol will be substantially selectively converted to the said corresponding diketone, and recovering said diketone,

said glacial acetic acid being added in the ratio of about 5 to about 500 parts by weight of glacial acetic acid per 100 parts by weight of said polyoxypropylene glycol,

said water, when added, being added in the ratio of about 5 to about 100 parts by weight of water per part 100 parts by weight of polyoxypropylene glycol and in the ratio of about 1 to about 3 parts of water per part of glacial acetic acid,

said aqueous solution of said hypochlorite containing from about 5 to about 25 wt. % of said hypochlorite and being slowly added to said reaction zone over a period of about 0.5 to 5 hours in an amount of from about 10 to about 100 parts by weight of said hypochlorite per 100 parts by weight of said polyoxypropylene glycol,

said polyoxypropylene diketone having the formula:



wherein n represents a positive number having a value of 1 to about 50.

4,960,949

LOW PRESSURE RHODIUM CATALYZED HYDROFORMYLATION OF OLEFINS

Thomas J. Devon; Gerald W. Phillips; Thomas A. Puckette; Jerome L. Stavinoha, and Jeffrey J. Vanderbilt, all of Longview, Tex., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 22, 1988, Ser. No. 288,596

Int. Cl.[5] C07C *45/50*

U.S. Cl. 568—454 **19 Claims**

1. A method for the hydroformylation an unsaturated compound to produce an aldehyde, wherein said unsaturated compound is selected from the group consisting of:

C_2 up to C_{20} mono olefins,

non conjugated polyolefins, and substituted derivatives thereof, wherein the substituted derivatives contain one or more of the substituents selected from the group consisting of:

OH,

OR″; wherein R″ is a C_1 up to C_{20} alkyl, aryl, alkaryl or aralkyl radical,

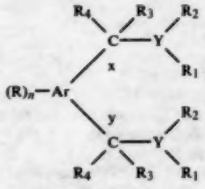
wherein R‴ is a C_1 up to C_{20} alkyl, aryl, alkaryl or arakyl radical,

wherein R′ is independently selected. from H, C_1 up to C_{12} alkyl radicals or substituted alkyl radicals, and C_6 up to C_{12} aryl radical or substituted aryl radicals, and each R^{iv} is independently selected from the members defined by R′, where the R^{iv} groups can be joined together to form a cyclic acetal or ketal,

SR″; wherein R″ is as defined above, and

wherein R‴ is as defined above;

said method comprising contacting at least one of said olefins with a mixture of hydrogen and carbon monoxide in a molar ratio falling in the range of 0.1:1 up to 20:1, and a catalyst comprising rhodium in chemical complex with at least one bidentate ligand having the structure:



wherein

Ar is selected from aromatic ring compounds having 6 up to 14 carbon atoms;

the x bonds and the y bonds are attached to adjacent carbon atoms on the ring structure;

each R, when present as a substituent, is independently selected from alkyl, alkoxy, aryloxy, aryl, aralkyl, alkaryl, alkoxyalkyl, cycloaliphatic, halogen, exclusive of (except Cl, Br or I on the aromatic nucleus on the carbon atom adjacent to the carbon atoms bearing the x or y bonds, alkanoyl, alkanoyloxy, alkoxycarbonyl, formyl, carboxylate moieties, sulfonic acid derivatives, or amino moieties;

n is a whole number in the range of 0–4 where Ar is phenyl; 0–6 where Ar is naphthyl; and 0–8 where Ar is phenanthryl or anthracenyl;

each R_1 and R_2 is independently selected from alkyl, aryl, aralkyl alkaryl, cycloaliphatic radicals and substituted derivatives thereof;

each R_3 and R_4 is independently selected from hydrogen and the R_1 substituents;

each of the above alkyl groups or moieties is straight or branched chain of 1–20 carbons;

each aryl group contains 6–10 ring carbons;

each cycloaliphatic group contains from 4–8 ring carbons; and

each Y is independently selected from the elements P, As, Sb and Bi;

said contacting being carried out in a reaction zone at a temperature in the range of about 20° up to 250° C. and a pressure in the range of about 15 up to 800 psig for a time sufficient for said olefin to react with said synthesis gas to form aldehyde product.

4,960,950

FORMATION OF NITROPHENYL ETHERS FROM POLYOLS AND NITROANISOLES

Visweswara R. Durvasula, Cheshire, Conn., assignor to The Dow Chemical Company, Midland, Mich.

Filed Mar. 28, 1988, Ser. No. 173,905

Int. Cl.[5] C07C *41/14*

U.S. Cl. 568—587 **33 Claims**

1. In a process for effecting an ether interchange reaction by heating together in the presence of a basic catalyst a nitroaromatic ether or thioether having the formula NO_2ArXR' (II) and an organic compound having the formula RXH (III) containing at least one alcohol or thioalcohol group, thereby exchanging the —XR radical of (III) for the—XR′ radical of (II) to form NO_2ArXR (I) and evolving R′XH (IV), wherein Ar represents an arylene radical, X is selected from the group consisting of —O— and —S—, R is a monovalent residue when only one —XH is present and is removed and is selected from the group consisting of alkyl, cycloalkyl, and aryl or R is a polyvalent residue when more than one —XH is present and removed and is selected from the group consisting of the residues of polymeric polyols when X is —O— and polymeric thiols when X is —S— each having a molecular weight from about 400 to about 12,000 and functionality of from about 2 to about 8 and R′ is selected from the group consisting of lower alkyl, cycloalkyl, and aryl, the improvement which comprises carrying out said process is an inert organic solvent while sparging said heated reactants with a gas thereby removing from the reaction site at least a portion of said solvent and at least a portion of the evolving R′XH sufficient to exchange in at least about 80 percent ether interchange.

4,960,951

NOVEL PERFLUOROPOLYETHERS

Mario J. Nappa, Newark; Allen C. Sievert, Elkton, and Walter R. Tong, New Castle, all of Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 303,150, Jan. 30, 1989, abandoned. This application Feb. 14, 1990, Ser. No. 480,351

Int. Cl.[5] C07C *43/12*

U.S. Cl. 568—615 **6 Claims**

1. A compound of the formula

$$[RO(R'')_xCF_2]_{4-y-z}CR'_y(CF_2OR)_z$$

where R is $—C_2F_5$, $—C_3F_7$, or $—CFCF_2CF_2CF_2$:

R′ is F, CF_3, or C_2F_5;

R″—CF_2CF_2O—, —$CF(CF_3)CF_2)O$— or —$CF_2CF(CF_3)O$—;

x is 1, 2, or 3;

y is 0, 1, or 2; and

z is 0, 1, 2, 3, or 4; with the proviso that $[(x+y)]\ (y+z) \leqq 4$.

4,960,952

ALKOXYLATION PROCESS CATALYZED BY LANTHANUM SILICATES AND METASILICATES

Richard A. Kemp, Stafford, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Aug. 31, 1989, Ser. No. 401,269

Int. Cl.[5] L07L *41/03*

U.S. Cl. 568—618 **30 Claims**

1. A process for the preparation of alkylene oxide adducts of active hydrogen containing organic compounds, which comprises contacting and reacting an alkylene oxide reactant comprising one or more vicinal alkylene oxides with an active hydrogen containing reactant comprising one or more active hydrogen containing organic compounds, in the presence of a catalytically effective amount of one or more lanthanum compounds comprising lanthanum silicate, lanthanum metasilicate and mixtures thereof.

4,960,953

PROCESS FOR PREPARING POLYGLYCEROLS

Gerald Jakobson, and Werner Siemanowski, both of Rheinberg, Fed. Rep. of Germany, assignors to Deutsche Solvay-Werke GmbH, Solingen, Fed. Rep. of Germany

Filed Mar. 24, 1989, Ser. No. 328,316

Claims priority, application Fed. Rep. of Germany, Mar. 24, 1988, 3809882

Int. Cl.[5] C07C *07/70, 41/03, 29/76*

U.S. Cl. 568—621 **31 Claims**

1. A process for preparing polyglycerols which are low in cyclic components, which comprises the steps of:

(a) reacting glycerol, diglycerol, a higher polyglycerol or a mixture thereof with epichlorohydrin, at a temperature of from 90° C. to 170° C., in a molar ratio of glycerols to epichlorohydrin of from 5:1 to 1:3, to produce a crude chlorohydrin/ether mixture;

(b) adding to the crude chlorohydrin/ether mixture, at a temperature of from 50° C. to 120° C., an amount of an alkaline medium substantially equivalent to the organically bound chlorine content of the chlorohydrin/ether mixture, to produce a crude glycerols mixture; and

(c) desalting the crude glycerols mixture by diluting said mixture with water and passing the resultant diluted aqueous glycerols solution first through one or more cation exchangers and then through one or more anion exchangers, to produce a substantially desalted aqueous glycerols solution, and recovering substantially purified glycerol, diglycerol and higher polyglycerols fractions.

4,960,954

PREPARATION OF ENOL ETHERS

Wolfgang Hoelderich, Frankenthal; Norbert Goetz, Worms; Leopold Hupfer, Friedelsheim, and Walter Himmele, Walldorf, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

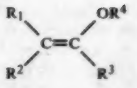
Filed Mar. 27, 1989, Ser. No. 329,007

Claims priority, application Fed. Rep. of Germany, Apr. 13, 1988, 3812236

Int. Cl.[5] C07C *41/28*

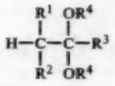
U.S. Cl. 568—691 **14 Claims**

1. A process for preparing an enol ether of the formula



(I)

by eliminating the radical R^4OH from an acetal or ketal of the formula



(II)

where

R^1 and R^2 are each independently of the other hydrogen, C_1–C_{12}-alkyl, C_3–C_8-cycloalkyl, C_3–C_8-cycloalkenyl, unsubstituted or C_1–C_4-alkyl-substituted aryl or C_7–C_{16}-aralkyl;

R^3 is $—CR^5(OR^4)_2$, $—COOR^4$ or $—COR^4$;

R^4 is C_1–C_{20}-alkyl, C_7–C_{20}-alkylaryl or C_7–C_{20}-aralkyl and;

R^5 is hydrogen or C_1–C_8-alkyl,

wherein comprises performing the reaction at from 50° to 500° C., under a pressure of from 0.1 to 50 bar and in the presence of a catalyst selected from the group consisting of (a) phosphoric acid or a hydrogen phosphate on a carrier material, (b) a phosphate, and (c) a zeolite.

4,960,955

PROCESS FOR MAKING 4-CHLORO-2-METHYL-5-NITRO-PHENOL

Thomas Clausen, Alsbach, and David Rose, Hilden, both of Fed. Rep. of Germany, assignors to Wella Aktiengesellschaft, Darmstadt, Fed. Rep. of Germany

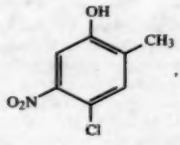
Filed May 17, 1989, Ser. No. 353,799

Claims priority, application Fed. Rep. of Germany, May 18, 1988, 3816839

Int. Cl.[5] **C07C** *79/32*

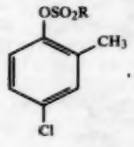
U.S. Cl. 568—709 **13 Claims**

1. A process of making 4-Chloro-2-methyl-5-nitro-phenol (I)



(I)

comprising nitrating with a mixture of nitric acid and sulfuric acid a 4-chloro-2-methyl-phenyl-sulfonate of the formula (II) at the 5 position



(II)

in which R is a residue selected from the group consisting of methyl-, ethyl-, trifluoromethyl-, phenyl- and tolyl- and SO_2R includes a sulfonyl residue, to form 4-Chloro-2-methyl-5-nitro-phenyl sulfonate and then cleaving said sulfonyl residue of said 4-chloro-2-methyl-5-nitro-phenyl sulfonate in the presence of a member selected from the group consisting of an acid and an alkali to form said 4-chloro-2-methyl-5-nitro-phenol.

4,960,956

MODIFIED BISPHENOLS HAVING AT LEAST ONE ARYLCYCLOBUTENEALKYL MOIETY AND CURED PRODUCTS THEREFROM

Pui-Kwan Wong, DS Amsterdam, Netherlands, assignor to Shell Oil Company, Houston, Tex.

Filed May 9, 1989, Ser. No. 349,544

Int. Cl.[5] **C08G** *65/38*

U.S. Cl. 568—722 **19 Claims**

1. A ring-arylcyclobutenealkylated di(hydroxyphenyl) compound having at least one arylcyclobutenealkyl substituent on at least one of the phenyl rings in which the alkyl moiety of each arylcyclobutenealkyl group is attached to a carbon atom of a six-membered aromatic ring.

4,960,957

PREPARATION OF PHENYLHYDROQUINONE

Paul W. Wojtkowski, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed May 30, 1989, Ser. No. 357,848

Int. Cl.[5] **C07C** *37/00, 39/12*

U.S. Cl. 568—747 **7 Claims**

1. A process for the synthesis of phenylhydroquinone which comprises:

reacting at a temperature of about 0 degrees C to 200 degrees C, a mixture, containing water, a benzenediazonium salt and hydroquinone, while maintaining the pH of the mixture between about 3 and about 9.

4,960,958

CATALYSTS FOR CATALYTIC PYROLYSIS OF PHENOL DISTILLATION RESIDUE AND PROCESS FOR RECOVERING USEFUL SUBSTANCES BY PYROLYSIS THE SAME

Tetsuo Imamura; Tatsuo Shirahata, both of Chiba, and Kichiro Shoji, Oosaka, all of Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

Division of Ser. No. 178,411, Apr. 6, 1988. This application Sep. 22, 1989, Ser. No. 410,811

Claims priority, application Japan, Apr. 9, 1987, 62-87638; Apr. 9, 1987, 62-87639

Int. Cl.[5] **C07C** *37/00, 37/68, 37/74*

U.S. Cl. 568—806 **4 Claims**

1. A process for recovering useful substances from a phenol distillation residue, said process comprising the steps of:

subjecting said residue to pyrolytic decomposition at a temperature of 200°–250° C. and under a pressure of from 400 mmHg to 4 kgf/cm^2abs. in the presence of at least one oxygen-containing metallic compound, as a catalyst, having a particle diameter of 0.002–100 μm, to produce a pyrolytic reaction mixture, said residue resulting from the separation by distillation of phenol, acetone and cumene from a reaction mixture obtained by oxidizing cumene with molecular oxygen to cumene hydroperoxide followed by acid cleavage; and

recovering useful substances such as cumene, alpha-methylstyrene and phenol from the pyrolytic reaction mixture, said oxygen-containing metallic compound being formed in said phenol distillation residue and selected from the group consisting of hydroxides, hydrated oxides and oxides of metals, excluding alkali metals, belonging to the third and fourth period of the Periodic Table.

4,960,959

PROCESS FOR THE MANUFACTURE OF ALKYNEDIOLS BY REACTION OF KETONES WITH ACETYLENE

Gerhard Thelen, Nottuln, Fed. Rep. of Germany, assignor to Huels Aktiengesellschaft, Marl, Fed. Rep. of Germany

Continuation of Ser. No. 176,232, Mar. 31, 1988, abandoned. This application Jul. 17, 1989, Ser. No. 381,996

Claims priority, application Fed. Rep. of Germany, Apr. 4, 1987, 3711382

Int. Cl.[5] **C07C** *29/42, 33/042, 33/14, 33/26*

U.S. Cl. 568—855 **9 Claims**

1. In a process for manufacturing and recovering an alkynediol by reacting a ketone, acetylene and potassium hydroxide, the improvement comprising:

synchronously reacting a C_{3-12} ketone, acetylene, potassium hydroxide and C_{1-4} alkyl-t-butyl ether solvent, wherein said potassium hydroxide is present as aqueous KOH having a water content of 10 to 24% by weight in a molar ratio relative to said ketone ranging from 1.0:1.0 to 1.6:1.0.

4,960,960

HYDROGENATION PROCESS

George E. Harrison, Billericay, and John R. Hensman, Letchworth, both of England, assignors to Davy McKee (London) Limited, London, England

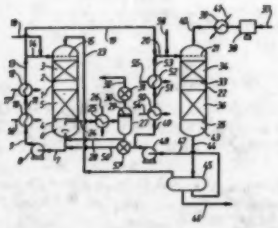
PCT No. PCT/GB87/00070, § 371 Date Oct. 5, 1988, § 102(e) Date Oct. 5, 1988, PCT Pub. No. WO88/05767, PCT Pub. Date Aug. 11, 1988

PCT Filed Feb. 5, 1988, Ser. No. 254,933

Claims priority, application United Kingdom, Feb. 6, 1987, 8702654

Int. Cl.[5] **C07C** *29/132, 29/14, 29/17, 29/20*

U.S. Cl. 568—881 **12 Claims**



1. A continuous process for hydrogenating an organic compound which can be hydrogenated in a liquid phase to a corresponding hydrogenation product, the process comprising:

(a) providing a hydrogenation plant comprising first and second hydrogenation zones connected in series each containing a charge of a solid heterogeneous hydrogenation catalyst;

(b) continuously supplying to an upper part of the first hydrogenation zone (i) a hydrogen-containing gas and (ii) a liquid phase containing the organic compound dissolved in a compatible diluent therefor;

(c) maintaining the first hydrogenation zone under temperature and pressure conditions conductive to hdyrogenation;

(d) allowing liquid phase to pass downwardly through the first hydrogenation zone;

(e) continuously recovering an intermediate reaction product from a lower part of said first hydrogenation zone;

(f) recovering a gaseous effluent from a lower part of the first hydrogenation zone;

(g) supplying intermediate reaction product from step (e) in liquid form to an upper part of said second hydrogenation zone;

(h) maintaining the second hydrogenation zone under temperature and pressure conditions conductive to hydrogenation;

(i) allowing intermediate liquid reaction product to pass downwardly through said second hydrogenation zone;

(j) supplying a hydrogen-containing feed gas to an upper part of the second hydrogenation zone;

(k) recovering a gaseous effluent stream from a lower part of the second hydrogenation zone;

(l) supplying material of the gaseous effluent stream of step (k) to form the hydrogen-containing gas of step (b);

(m) recovering a liquid hydrogenation product containing stream from a lower part of the second hydrogenation zone; and

(n) purging material of the gaseous effluent stream of step (f) from the hydrogenation plant.

4,960,961

PROCESS FOR THE PREPARATION OF TERT.-AMYL ALCOHOL (TAA)

Bernhard Schleppinghoff, Dormagen; Reiner Malessa, Tübingen; Christian Gabel; Hans-Volker Scheef, both of Dormagen, and Mathias Lux, Cologne, all of Fed. Rep. of Germany, assignors to EC Erdolchemie GmbH, Cologne-Worringen, Fed. Rep. of Germany

Filed Jan. 6, 1989, Ser. No. 294,438

Claims priority, application Fed. Rep. of Germany, Jan. 19, 1988, 3801273

Int. Cl.[5] **C07C** *29/04, 31, 125*

U.S. Cl. 568—899 **15 Claims**

1. A process for the preparation of tert.-amyl alcohol (TAA) comprising conducting a hydration reaction of a reaction mixture consisting of an (a) i-amylene or a C_5-distillation cut containing i-amylene, or a concentrated or essentially pure i-amylene, (b) water and (c) up to 5 weight % TAA, relative to the amount of i-amylene, on an acid cation exchanger, wherein the reaction is carried out in a range from 5° C. below to 5° C. above the boiling point of the i-amylene or the C_5-distillation cut.

4,960,962

SELECTIVE DEHYDROBROMINATION

David R. Brackenridge, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Filed Jul. 19, 1989, Ser. No. 381,829

Int. Cl.[5] **C07C** *17/24, 17/34*

U.S. Cl. 570—200 **20 Claims**

1. A process which comprises (i) feeding into a thermal dehydrobromination zone maintained at a temperature of least 475° C., a mixture consisting of (a) one or more 2-bromoalkyl ar-bromoaromatic compounds, (b) a substantial excess of water, and (c) optionally a carrier gas, whereby the bromoalkyl side chain is converted by dehydrobromination to an alkenyl group, and (ii) maintaining the residence time for the reactant(s) and reaction products in such high temperature dehydrobromination zone at less than about 5 seconds, so that one or more ar-bromoaromatic compounds having an alkenyl side chain are produced.

4,960,963

PROCESS FOR PRODUCING VINYLCHLORIDE MONOMER BY PYROLYSIS OF 1,2-DICHLOROETHANE

Yutaka Teshima, Shinnanyo, and Satoshi Onishi, Tokuyama, both of Japan, assignors to Tosoh Corporation, Shinnanyo, Japan

Continuation of Ser. No. 125,136, Nov. 25, 1987, abandoned. This application Jan. 12, 1990, Ser. No. 463,855

Claims priority, application Japan, Nov. 29, 1986, 61-283083

Int. Cl.[5] **C07L** *17/34*

U.S. Cl. 570—226 **8 Claims**

1. A process for producing vinyl chloride monomer by the pyrolysis of 1,2-dichloroethane, comprising the steps of:

(i) feeding liquid 1,2-dichloroethane to a heat exchange means to produce substantially gaseous 1,2-dichloroethane;

(ii) feeding said substantially gaseous 1,2-dichloroethane into a pyrolysis furnace to produce a high temperature crack gas; and

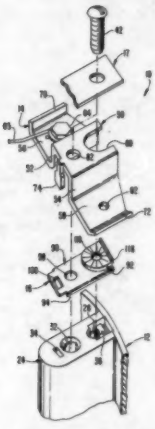
(iii) exchanging heat between said liquid 1,2-dichloroethane and said high temperature cracked gas in said heat exchange means; wherein said cracked gas has a flow rate of 5 m/s to less than 20 m/s and exchanging heat until said cracked gas is cooled to a temperature of 180–350° C.

4,960,964

QUICK SET GROUNDING ASSEMBLY

Kenneth R. Schnell, and William E. Slater, both of South Bend, Ind., assignors to Hubbell Incorporated, Orange, Conn.

Filed Feb. 15, 1989, Ser. No. 310,391
Int. Cl.[5] H02G 3/08
U.S. Cl. 174—51 23 Claims



1. An electrical wiring box assembly adapted to engage standard mounting screws of an electrical wiring device to be mounted in the box assembly, comprising:

a nonmetallic electrical box including a pair of lugs located at opposite ends of said box, said lugs having fastening means for releasably engaging the mounting screws of the wiring device thereto;

a metallic grounding member including coupling means for releasably coupling said grounding member to said box, and grounding means for securing a ground conductor wire of an electrical cable thereto; and

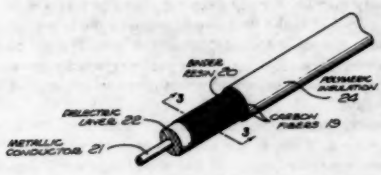
a metallic conducting means for electrically connecting the mounting screw of the electrical wiring device and said grounding member, said conducting means including attaching means for releasably retaining said conducting means to said grounding member.

4,960,965

COAXIAL CABLE WITH COMPOSITE OUTER CONDUCTOR

Daniel W. Redmon, 1215 Riverside Dr., Lompoc, Calif. 93436, and David K. Brown, 3700 S. Sepulveda Blvd. #304, Los Angeles, Calif. 90034

Filed Nov. 18, 1988, Ser. No. 272,784
Int. Cl.[5] H01B 7/34
U.S. Cl. 174—102 R 10 Claims



1. A coaxial cable especially for electric signal transmission in the video to microwave frequency range, said cable having an inner conductor of circular cross-section and a solid dielectric layer over said inner conductor, said dielectric layer having a perimeter surface of generally circular cross-section generally concentric with respect to said inner conductor, comprising:

an outer conductive shield formed by deposition of plural layers of elongated carbon filaments along said dielectric perimeter in lateral juxtaposition and extending generally parallel to said inner conductor; and

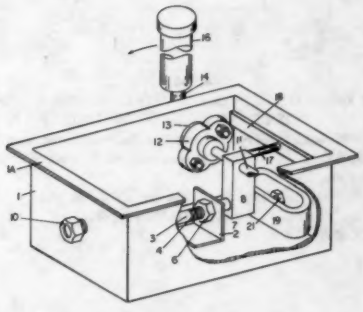
a curable resin impregnating said carbon filament layers to produce a rigid composite outer conductor for said cable.

4,960,966

LIMIT SWITCH

William B. Evans, and Charles F. Evans, III, both of Louisville, Ky., assignors to Enterprise Sales & Company Inc., Louisville, Ky.

Filed Nov. 6, 1989, Ser. No. 431,928
Int. Cl.[5] H01H 3/16
U.S. Cl. 200—61.41 1 Claim



1. A switch device including an enclosure having a pivot arm extending across the enclosure with an external distal arm attached thereto to indicate the presence of an object, the pivot arm carries, an actuator device for rotational movement corresponding to the movement of the distal arm, a stop device connected to an inside surface of the enclosure extending toward the actuator device to engage the actuator device and limit the movement of the actuator device in a first direction, a sensor located in proximity to the actuator device when the actuator device engages the stop device, a generally circular elastomeric spring device attached to another inside surface of the enclosure and adapted to spring outwardly to normally engage the side of the actuator device opposite the sensor device to bias the actuator device to engagement with the stop device and to allow the movement of the actuator device away from the stop device and the sensor upon engagement of an object with the distal arm.

4,960,967

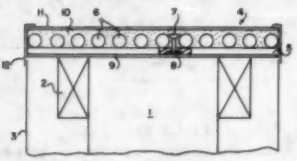
DEVICE FOR PROTECTING THE POLES OF INDUCTORS AND INDUCTOR EQUIPPED WITH SUCH DEVICE

Marc Buffenoir; René Pierret, both of Metz; Jean Hellegouarc'h, Le Perreux Sur Marne, and Gérard Prost, Boulevard Jean Jaurés, all of France, assignors to Institut De Recherches De La Siderurgie Francaise, Maizieres-les-Metz, France

Filed Apr. 29, 1989, Ser. No. 343,239
Claims priority, application France, Apr. 26, 1988, 88 05940
Int. Cl.[5] H05B 6/42
U.S. Cl. 219—10.491 17 Claims

1. An electromagnetic indicator having poles with a polar face and a protective device for a polar face of each pole, said protective device comprising a heat exchanger comprising at least one non-magnetic metal tube, each tube being constituted by several tube elements joined end to end and arranged sub-

stantially in a same plane parallel with said polar face, and means for circulating a cooling fluid through said at least one



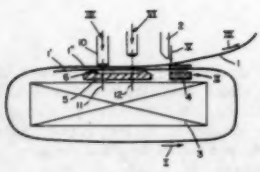
tube, any two tube elements being electrically joined by at most one electrical junction.

4,960,968

BONDING METHOD OF BINDING STRAP END PORTIONS BY SPOT-WELDING

Kouichi Kusakabe; Ryozo Hayasaka, both of Kobe, and Kanami Kato, Sakai, all of Japan, assignors to Signode Corporation, Glenview, Ill.

Filed Aug. 21, 1989, Ser. No. 396,952
Int. Cl.[5] B23K *11/10*
U.S. Cl. 219—78.01 4 Claims



1. A bonding method for bonding over-lapped leading and trailing strap end portions to each other by spot-welding operations, comprising the steps of:

winding a binding strap around an article to be bound;

gripping a portion of said strap disposed upstream of said leading end portion of said strap at a strap gripping station;

tensioning said binding strap by retracting a residual supply portion of said binding strap disposed upstream of said trailing end portion of said binding strap;

lowering an electrode from an upper position and into contact with said overlapped strap end portions so as to pressurize said overlapped strap portions together with an undersurface electrode plate;

energizing said electrode and said undersurface electrode plate so as to carry out a spot-welding operation at a first spot-welding position remote in the downstream direction from said strap gripping station after said binding strap has been gripped at said portion disposed upstream of said leading end portion of said binding strap and after said binding strap has been tensioned;

moving said electrode laterally to a second spot-welding position so as to carry out a spot-welding operation at a second spot-welding position adjacent to said strap gripping station; and

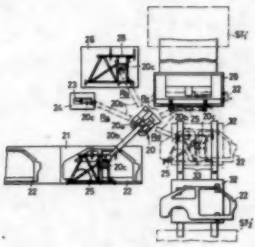
cutting said trailing end portion of said binding strap from said residual portion of said binding strap after said spot-welding operation at said second spot-welding position is carried out.

4,960,969

METHOD OF PROCESSING AND TRANSFERRING VEHICLE BODY MEMBERS WITH A ROBOT

Makoto Shigenaka, Hiroshima, Japan, assignor to Mazda Motor Corporation, Hiroshima, Japan

Filed Jun. 6, 1989, Ser. No. 361,951
Claims priority, application Japan, Jun. 11, 1988, 63-144166
Int. Cl.[5] B23K *11/10*
U.S. Cl. 219—91.2 18 Claims



1. A method of processing and transferring vehicle body members with a robot comprising the steps of,

providing a robot having a body and an arm extending from the body to be connected and disconnected selectively with each of a processing device and a holding device,

processing a first vehicle body member with a processing device attached to the robot installed between first and second work stations adjoining each other,

attaching a holding device to the robot,

holding the first vehicle body member with the holding device attached to the robot in place of the processing device,

moving the robot to transfer the vehicle body member held by the holding device to an entrance to the first work station,

releasing the holding device engaging with the first vehicle body member from the robot so as to allow the first vehicle body member accompanied with the holding device to be conveyed into the first work station,

attaching the processing device to the robot,

processing a second vehicle body member with the processing device attached again to the robot during a period in which the first vehicle body member is subjected to a predetermined processing in the first work station,

releasing the processing device from the robot,

attaching the holding device engaging with the first vehicle body member having been subjected to a predetermined processing in the first work station to the robot,

moving the robot to transfer the first vehicle body member having been subjected to the predetermined processing in the first work station to an entrance to the second work station,

releasing the first vehicle body member from the holding device attached to the robot so as to allow the first body member to be conveyed into the second work station,

moving the robot to transfer the second vehicle body member held by the holding device to the entrance to the first work station, and

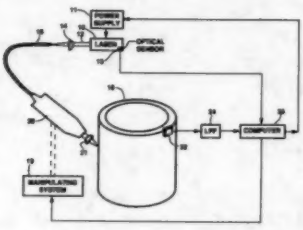
releasing the holding device engaging with the second vehicle body member from the robot so as to allow the second vehicle body member accompanied with the holding device to be conveyed into the first work station.

4,960,970

METHOD AND APPARATUS FOR ACOUSTIC BREAKTHROUGH DETECTION

John L. Schneiter, Latham, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Aug. 11, 1989, Ser. No. 392,494
Int. Cl.[5] B23K *26/00*
U.S. Cl. 219—121.6 18 Claims



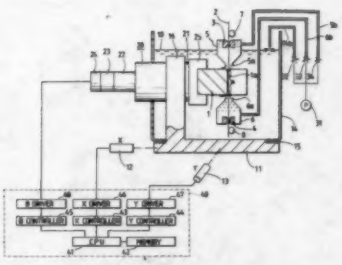
1. Apparatus for laser processing of a workpiece, said apparatus comprising:
means for applying pulsed laser light to the workpiece to cause vibrations therein;
means for acoustically monitoring said vibrations in the workpiece, said monitoring means comprising an accelerometer adapted to be mounted on the workpiece; and
means for determining when said vibrations change.

4,960,971

WIRE EDM WITH APPARATUS SUPPORTING A WORKPIECE THROUGH WALL OF MACHINING BATH

Tasuku Kawanabe, Nagoya, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed Aug. 24, 1989, Ser. No. 397,842
Claims priority, application Japan, Aug. 31, 1988, 63-114258[U]
Int. Cl.[5] B23H *7/02*
U.S. Cl. 219—69.12 12 Claims



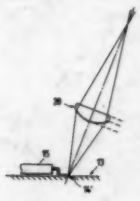
1. A wire electrical discharge machining apparatus comprising:
a wire electrode extending along one axis for applying an electrical discharge to a workpiece;
moving means for moving the workpiece with respect to the wire electrode, a machining gap being defined between the wire electrode and the workpiece;
nozzle means for injecting a machining liquid to the machining gap;
a machining bath accumulating the machining liquid therein for dipping the workpiece in the machining liquid;
a rotation shaft having a chuck unit for supporting the workpiece for rotatably positioning the workpiece in the machining liquid, said rotation shaft affixed to said machining bath such that said rotation shaft and said machining bath are moved together by said moving means for moving the workpiece relative to said wire electrode;
a drive means for rotating the rotation shaft; and
control means for controlling rotation of the rotation shaft.

4,960,972

LIGHT-BEAM-OPERATED HEATING MACHINE

Masaaki Nakamura, and Tsutomu Yasuoka, both of Saitama, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Jul. 21, 1989, Ser. No. 382,887
Claims priority, application Japan, Jan. 12, 1989, 01-5643
Int. Cl.[5] B23K *1/005*
U.S. Cl. 219—85.12 5 Claims



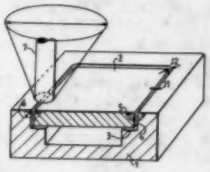
1. In a light-beam-operated heating apparatus of the type in which at least one light beam, which is non-uniform in intensity along one axis in a plane perpendicular to the optical axis of the apparatus, is concentrated along a second axis perpendicular to and in the same plane as said one axis by a concentrator lens to form a line of light focused onto a workpiece said line of light having a longitudinal axis which is along said one axis and a width along said second axis, the improvement comprising:
light diffuser means comprising a diffuser lens positioned in the path of said beam of light for diffusing said beam along said one axis to reduce the non-uniformity of said intensity distribution.

4,960,973

METHOD FOR WELDING TWO METALLIC PARTS BY LASER BEAM AND ELECTRONIC PACKAGE WELDED THEREBY

Alain Fouche, Paris, and Serge Malbe, Gif Sur Yvette, both of France, assignors to Thomson Composants Microondes, Puteaux, France

Filed Sep. 26, 1989, Ser. No. 412,932
Claims priority, application France, Sep. 30, 1988, 88 12800
Int. Cl.[5] B23K *26/00*
U.S. Cl. 219—121.64 3 Claims



1. A method for the laser beam welding of first and second metallic parts each having a lateral face facing each other, said first and second metallic parts having a clearance between their said lateral faces, comprising the steps of:
discharging a laser a first time, said laser positioned with a

first offset with respect to one of said lateral faces, wherein the metal of one of said metallic parts is partially melted and collapses causing said first and second metallic parts to come into contact with each other thereby eliminating said clearance;

discharging said laser a second time, said laser positioned with a second offset which is smaller than said first offset with respect to the same one of said lateral faces, thereby melting the metal of both of said metallic parts and forming a weld joint.

4,960,974

METHOD OF ASSEMBLING A VEHICLE BODY PANEL MEMBER

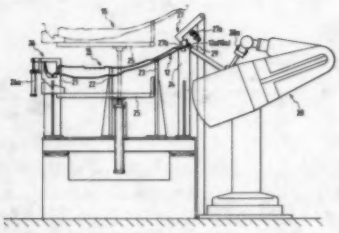
Makoto Shigenaka, Hiroshima, Japan, assignor to Mazda Motor Corporation, Hiroshima, Japan

Filed Jun. 6, 1989, Ser. No. 361,953

Claims priority, application Japan, Jun. 11, 1988, 63-144165

Int. Cl.[5] B23K *9/00*

U.S. Cl. 219—137 R **15 Claims**



1. A method of assembling a vehicle body panel member comprising the steps of,

coupling each adjacent two of subdivided outer panel components with each other to incorporate the subdivided outer panel components into an outer panel by means of welding,

fixing the incorporated outer panel at a predetermined position,

providing the outer panel fixed at the predetermined position with arc welding at a junction between two adjacent subdivided outer panel components for smoothing welded panel surfaces thereof that appear on an external surface of the outer panel, and

coupling subdivided inner panel components with the outer panel after the outer panel arc welding has been completed in such a manner that the subdivided inner panel components are disposed on the inside of the outer panel to form an inner panel attached to the outer panel and thereby the vehicle body panel member is obtained.

4,960,975

METHOD AND APPARATUS FOR OPERATING A SOLDERING STATION

Michael Weinbrecht, Wertheim, Fed. Rep. of Germany, assignor to ERSA Ernst Sachs KG GmbH & Co., Wertheim, Fed. Rep. of Germany

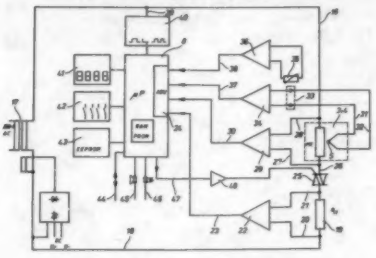
Filed Apr. 12, 1989, Ser. No. 336,727

Claims priority, application Fed. Rep. of Germany, Apr. 12, 1988, 3812139

Int. Cl.[5] H05B *1/02*

U.S. Cl. 219—241 **11 Claims**

1. Method of controlling the operating temperature of a soldering iron to a predetermined value with the aid of a temperature sensor arrangement contained in the soldering iron which, depending on the measured temperature, switches a heating element of the soldering iron on or off, the method comprising the steps of stabilizing the temperature at the soldering tip (12), independently of the heat flow emanating from the soldering tip (12); arranging along the longitudinal extent of the tip body a controlled system on which several temperature sensors (4,5,6) are spaced from each other and from the soldering tip (12); supplying values picked up by the tempera-



ture sensors (4,5,6), such as temperature, rate of temperature change, temperature rise, to a computer (8) programmed to determine the temperature of the soldering tip (12) and maintaining it constant independently of the heat flow.

4,960,976

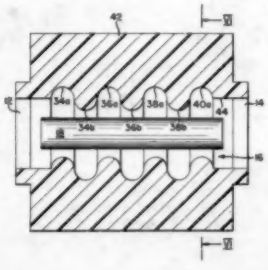
ELECTRICAL RESISTANCE WATER HEATER EFFECTING NON-LAMELLAR FLOW TO AVERT CAVITATION THEREIN

Harold Insley, Bridgeport, Conn., assignor to Creative Capital Corp., Greenwich, Conn.

Filed Jul. 6, 1988, Ser. No. 215,597

Int. Cl.[5] F24H *1/10*; H05B *3/24*

U.S. Cl. 392—485 **6 Claims**



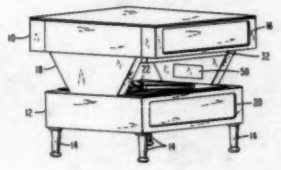
1. An electrical resistance heater comprising an elongate housing, a heating element cartridge disposed in said housing, said cartridge defining a fluid flow passage extending longitudinally therethrough, said cartridge having interior surface bounding said passage and including deflector portions extending from said surface into said passage, said deflector portions being configured to induce non-lamellar flow through said passage and thereby avert cavitation therein, a fluid inlet port and a fluid outlet port in flow communication with said passage, and an electrical resistance element extending longitudinally in said passage in spaced relation to said interior surface.

4,960,977

INFRA-RED BAKING OVEN

Lorne B. Alden, Shelburne, Vt., assignor to G. S. Blodgett Co., Inc., Burlington, Vt.

Filed Apr. 20, 1989, Ser. No. 340,747
Int. Cl.[5] F24C 7/04; F27B 9/16
U.S. Cl. 219—388 9 Claims



1. An oven adapted to cook with low power infra-red radiation having a wavelength of from 3–6 microns comprising:

a downwardly opening upper module and an upwardly opening lower module; a pair of opposed side plates interconnecting said modules at opposed sides so that said upper module is spaced a predetermined distance above said lower module;

a shroud disposed above the lower module and linear actuator means coupling said shroud and said upper module for moving said shroud between an upper position disposed within said upper module and a lower position adjacent the opening of said lower module;

food support means rotatably mounted in said lower module including a flat turntable mounted in the opening of said module for supporting food to be cooked and for rotating said food during cooking;

first infra-red emitter disposed adjacent, in alignment with, below and parallel to said turntable;

second infra-red emitter disposed in said shroud, in alignment with and parallel to said turntable; and

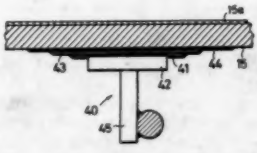
a pair of side infra-red emitters one disposed on the inside surface of each side plate perpendicular to plane intersecting the plane containing said turntable.

4,960,978

COOKING APPLIANCE

Josef Lorenz, and Robert Kicherer, both of Oberderdingen, Fed. Rep. of Germany, assignors to E.G.O. Elektro-Gerate Blanc u. Fischer, Fed. Rep. of Germany

Filed Feb. 22, 1989, Ser. No. 314,000
Int. Cl.[5] H05B 3/70
U.S. Cl. 219—455 19 Claims



1. A cooking appliance, comprising:

a carrier plate having an underside;

at least one electric heating means applied to the underside of the carrier plate, the heating means including film resistor means with a resistance layer including a glass melt and defining a contact area; and,

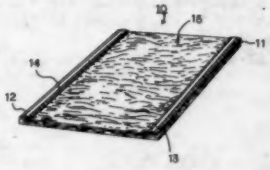
electric connection means applied to the film resistor means, including a metal bolt having an enlarged bearing surface, which is fastened by means of a metal-filled-glass brazing solder to the contact area.

4,960,979

ELECTRICALLY HEATABLE SHEET PREPARED BY PAPER

Makoto Nishimura, Burume Omori Rooms No. 705, 3-10-10, Omori Nishi, Ota-ku, Tokyo, Japan

Filed May 26, 1989, Ser. No. 358,546
Claims priority, application Japan, Dec. 6, 1988, 63-307016; Dec. 6, 1988, 63-307017
Int. Cl.[5] H05B 3/34
U.S. Cl. 219—549 12 Claims



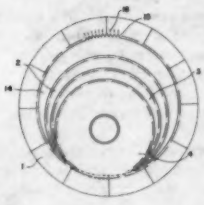
1. An electrically heatable sheet comprising 3 to 20 % by weight of carbon fibers and 97 to 80 % by weight of natural pulp, said carbon fibers consisting of at least two groups of different lengths, each of the carbon fibers of one group having a length of not shorter than 3 mm and shorter than 5 mm, each of the carbon fibers of the other group having a length of not shorter than 5 mm and not longer than 10 mm, said carbon fibers being selected from the group consisting of pitch type carbon fibers, polyacrylonitrile type carbon fibers and mixtures thereof, said sheet having a thickness of not thicker than 150 μm and a basis weight of not larger than 55 g/m^2.

4,960,980

BIOCLOCK CALCULATING DEVICE FOR HUMAN BODY

Fu Shengqiao, Physics Department, Xiangtan University, Hunan, China

Filed Dec. 12, 1988, Ser. No. 282,558
Claims priority, application China, Dec. 18, 1987, 87107512
Int. Cl.[5] G06C 3/00
U.S. Cl. 235—78 RC 13 Claims



1. A human biorhythms calculating device comprising:

a base disc;

a date ring fixed on the said base disc includes a face having a calendar scale and internal teeth on an inner edge;

a plurality of cycle discs displaying respectively physical, emotional and intelligent biorhythms of a human body;

each cycle disc includes a central hole of a distinct predetermined size, a number of external teeth corresponding to a number of days in a related biorhythm cycle, and a curve on a surface of each cycle discs representing related biorhythm cycles, and an age scale associated with said bior-

hythm cycles, at least one set of said cycle discs being superimposed eccentrically within said date ring;

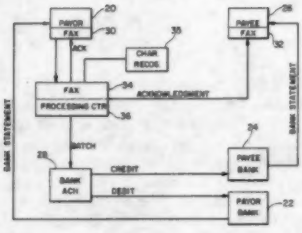
a cylindrical pushing piece positioned through the central holes of said cycle discs for movement within said date ring to exert an outward force on all said cycle discs superimposed within said date ring, so that the external teeth of said cycle discs will be meshed with the internal teeth of said date ring, and providing said cycle discs with a tangential force so that said cycle discs are dovetailed with said date ring and rotate along an inner edge of the date ring.

4,960,981

METHOD OF AND SYSTEM FOR ELECTRONIC FUNDS TRANSFER VIA FACSIMILE MACHINES

William M. Benton, Fort Lauderdale, and William Mee, Pompano Beach, both of Fla., assignors to Moneyfax, Inc., Ft. Lauderdale, Fla.

Filed Jan. 17, 1989, Ser. No. 298,348
Int. Cl.[5] G06F *15/30*
U.S. Cl. 235—379 **19 Claims**



1. An electronic funds transfer system for carrying out financial transactions between parties to a transaction, comprising:

at least one remote facsimile machine at the site or sites of the parties to the transaction, each said facsimile machine including a document reader, a modem for transmitting an image of said document and receiving document images received thereat, and a document printer for printing incoming images on a recording medium;

a central facsimile machine located at a central facility for receiving incoming images sent from said at least one remote facsimile machine at the site or sites of said parties, a central computer at said central facility and means for formatting said incoming images into a form recognizable by said central computer;

a transaction voucher having a first region for containing at least the amount of a transaction, an account number and the written signature of a party to the transaction;

images of transaction vouchers sent by the at least one remote facsimile machine to said central facsimile machine being formatted and processing by said central computer; and

means incorporated in the central computer for clearing the transaction based upon said incoming voucher images received from said at least one remote facsimile machine.

4,960,982

IC CARD WITH SECURE MASS STORAGE MEMORY

Kenichi Takahira, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

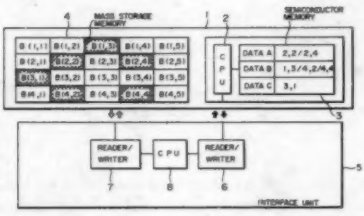
Filed Apr. 7, 1988, Ser. No. 178,551
Claims priority, application Japan, Apr. 9, 1987, 62-87801
Int. Cl.[5] G06K *7/01, 19/08, 19/073*
U.S. Cl. 235—382 **9 Claims**

1. An information recording system comprising:

an IC card having an onboard microprocessor, an onboard semiconductor memory controlled by the onboard microprocessor, and an onboard mass storage memory accessible from the surface of the IC card,

interface means having first reader/writer means for interfacing with the semiconductor memory through the microprocessor and second reader/writer means for interfacing directly with the mass storage memory,

the mass storage memory having separately identifiable fields for storing blocks of data, at least some of the fields being non-contiguous but adapted to store blocks of data which are related to each other,



the semiconductor memory having storage locations for storing field identification information needed to selectively identify fields in the mass storage memory storing blocks of related data,

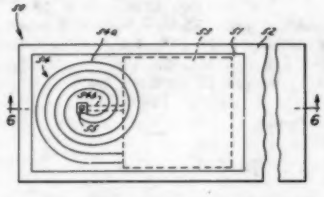
and means in the interface unit for accessing the field identification information from the semiconductor memory through the microprocessor and utilizing said field identification information for accessing blocks of related data in the mass storage memory.

4,960,983

NONCONTACT TYPE IC CARD AND SYSTEM FOR NONCONTACT TRANSFER OF INFORMATION USING THE SAME

Takesi Inoue, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 23, 1988, Ser. No. 210,231
Claims priority, application Japan, Sep. 28, 1987, 62-240919; Mar. 30, 1988, 63-74497
Int. Cl.[5] G06K *7/08, 19/02*
U.S. Cl. 235—449 **21 Claims**



1. In a system for nonconduct transfer of information between an IC card and a card reader/writer, the improvement comprising:

a first integrated circuit chip on the IC card, said first chip comprising a card logic circuit for controlling the operation of said card, card information transfer means on the integrated circuit chip including at least a first electromagnetically inductive coil for effecting electromagnetic transfer of information and means for coupling said first coil to said card logic circuit, said first coil having multiple spiral windings with at least the innermost of said windings enclosing an area on the chip which is smaller than the area occupied by the logic circuit;

a second integrated circuit chip on the reader/writer, said second chip comprising reader/writer information transfer means having at least a second electromagnetically

inductive coil for effecting electromagnetic transfer of information to and from said first coil of said IC card; and supply means located at least partly on said IC card for providing power to said first integrated circuit chip.

4,960,984

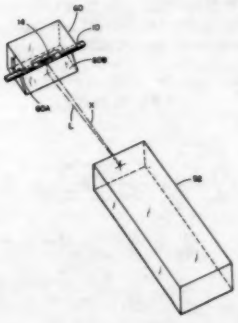
METHOD AND APPARATUS FOR READING LASED BAR CODES ON SHINY-FINISHED FUEL ROD CLADDING TUBES

Mark P. Goldenfield, Columbia, and David V. Lambert, St. Matthews, both of S.C., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Feb. 4, 1988, Ser. No. 152,288

Int. Cl.[5] G06K *7/10, 7/01*

U.S. Cl. 235—462 **8 Claims**



1. In a nuclear fuel rod identification system, a method of reading a bar code etched directly on a surface of a nuclear fuel rod, comprising the steps of:

(a) defining a pair of light diffuser surfaces adjacent one another but in oppositely inclined relation to a beam of light emitted from a light reader;

(b) positioning a fuel rod, having a cylindrical surface portion with a bar code etched directly thereon, relative to the light diffuser surfaces such that the surfaces are disposed adjacent to and in oppositely inclined relation along opposite sides of the fuel rod surface portion and the fuel rod surface portion is aligned with the beam of light emitted from the light reader;

(c) directing the beam of light on the bar code on fuel rod cylindrical surface portion such that the light is reflected therefrom onto one of the light diffuser surfaces; and

(d) receiving and reading the reflected light from the bar code via the one of the light diffuser surfaces to the light reader.

4,960,985

COMPACT OMNIDIRECTIONAL LASER SCANNER

Carl H. Knowles, Moorestown, N.J., assignor to Metrologic Instruments, Inc., Bellmawr, N.J.

Continuation of Ser. No. 938,931, Dec. 8, 1986, abandoned, which is a continuation-in-part of Ser. No. 800,486, Nov. 21, 1985, Pat. No. 4,713,532. This application Sep. 27, 1989, Ser. No. 413,141

The portion of the term of this patent subsequent to Dec. 15, 2004, has been disclaimed.

Int. Cl.[5] G06K *7/10*

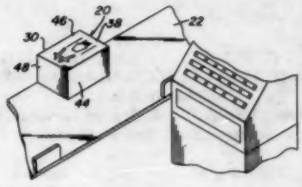
U.S. Cl. 235—467 **8 Claims**

1. A compact laser scanner positioned on top of a horizontally disposed scanner counter, said scanner producing a scanning pattern into which a bar code can be inserted to enable the reading of said code, said scanner comprising:

a. a housing with a plurality of planar side walls and planar end walls, a planar bottom wall and a planar top wall, said top wall having a light transmissive opening, said scanner being directly mounted on one of said side walls on top of said counter;

b. a laser beam generating means, disposed within said housing, for producing a laser beam,

c. a beam sweeping means, disposed within said housing, for cyclically sweeping said beam;



d. a reflective means disposed within said housing for projecting said beam outside of said housing, said beam sweeping means and said reflecting means being oriented so that for each sweep of said beam, said reflecting means projects an intersecting line scanning pattern out of said light transmissive opening.

4,960,986

DEVICE AND METHOD FOR DETECTING A FOCUSING STATE WITH RELIABILITY CHECKING

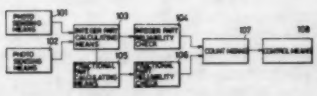
Yoshimi Ohno, Kawasaki, and Takayuki Hatase, Fukuoka, both of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Sep. 8, 1989, Ser. No. 404,568

Claims priority, application Japan, Sep. 13, 1988, 63-229388

Int. Cl.[5] G01J *1/20;* **G03B** *3/00*

U.S. Cl. 250—201.7 **7 Claims**



5. A method for detecting a focusing state of an objective by receiving light beams emitted from an object and passing through first and second portions of the objective that are disposed oppositely with respect to an optical axis of the objective, said method comprising the steps of:

receiving and converting first and second images formed respectively by light beams passed through said first and second portions into first and second electrical signals;

calculating an integer part of a displacement of said first and second images one from the other by using the electrical signals formed in said receiving and converting step;

checking if the integer part calculation result is reliable enough for focus detection, by using the electrical signals formed in said receiving and converting step;

calculating a fractional part of said displacement of said first and second images one from the other;

checking if the fractional part calculation result is reliable enough for focus detection, by using the electrical signals formed in said receiving and converting step;

counting the number of decisions of unreliability made by said integer part reliability checking step and said fractional part reliability checking step;

checking additionally if the latest integer part calculation result is reliable enough for focus detection, by using the electrical signals formed in said receiving and converting step; and

executing such a control that when a count in said counting step reaches a preset value, and when the latest decision of unreliability is made for the integer part calculation result,

a subsequent lens drive is prohibited, and the receiving and converting step and integer part calculating step are repeated, while presenting a display of "Unmeasurable", and that when a decision of reliability is made for the integer part calculation result in said additionally checking step, said control goes out of said repetition of the receiving and converting step and the integer part calculating step, and removes the prohibition of the lens drive.

4,960,987

X-RAY IMAGE INTENSIFIER WITH CONDUCTIVE-COAT ELECTRODES ON INSULATED METAL SIDEWALLS

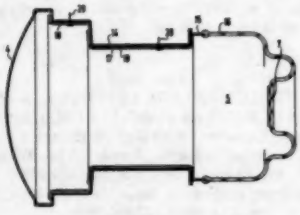
Richard Frank, Erlangen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Sep. 11, 1989, Ser. No. 405,218

Claims priority, application European Pat. Off., Sep. 29, 1988, 88116129.3

Int. Cl.[5] H01J *31/50, 29/88*

U.S. Cl. 250—213 VT **3 Claims**



1. An x-ray image intensifier comprising:

an x-ray-sensitive input luminescent screen;

an output luminescent screen;

a one-piece sheet metal wall having opposite ends respectively closed by said input luminescent screen and said output luminescent screen;

an insulating layer covering the inside of said sheet metal wall; and

an electrode system adapted for connection to external voltages for focusing electrons generated by the incidence of x-radiation on said input luminescent screen onto said output luminescent screen, said electrode system consisting of a plurality of electrodes formed by a conductive coat applied over selected regions of said insulating layer on said one-piece sheet metal wall.

4,960,988

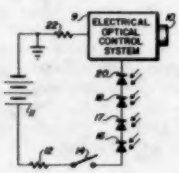
SAFETY SHUT-OFF PROTECTION SYSTEM

Robert A. Simms, Phoenix, Ariz., assignor to Murasa International, Long Beach, Calif.

Filed Mar. 6, 1989, Ser. No. 318,834

Int. Cl.[5] H01J *31/50*

U.S. Cl. 250—213 VT **22 Claims**



1. A safety shut-off protection system for a light sensitive system having a sensing element therein, said protection system including in combination:

electrical control circuit means coupled with said sensing element of said light sensitive system for activating and deactivating said sensing element; and

light responsive safety switch means having a light receiving portion concentrically mounted with respect to said light sensitive system and connected in electrical circuit with said electrical control circuit means and including means physically located to receive light directed toward said light sensitive system for deactivating said sensing element in response to light of a predetermined intensity impinging thereon.

4,960,989

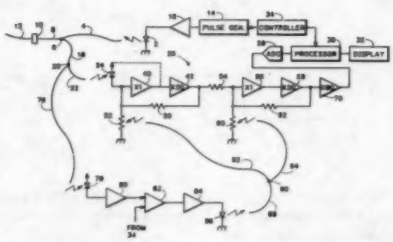
OPTICAL TIME DOMAIN REFLECTOMETER HAVING A RECEIVER WITH SELECTIVELY CONTROLLED GAIN

John D. Liebenrood, Portland, Oreg., and Donald H. McMahon, Carlisle, Mass., assignors to Photon Kinetics Inc., Beaverton, Oreg.

Filed Mar. 28, 1989, Ser. No. 329,796

Int. Cl.[5] H01J *5/16*

U.S. Cl. 250—227.15 **13 Claims**



1. An optical time domain reflectometer for testing an optical fiber, comprising an opto-electric transducer for detecting optical energy received at one end of a fiber under test, an amplifier having an input terminal connected to the opto-electric transducer, photoconductive switch means connected between the amplifier input terminal and a reference potential level, and means for selectively illuminating the photoconductive switch means.

4,960,990

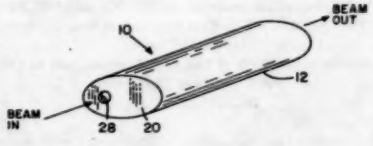
NON COHERENT PHOTONEUTRALIZER

Michael J. Lavan; George R. Edlin, and Daniel L. Whitener, all of Huntsville, Ala., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Dec. 26, 1989, Ser. No. 456,900

Int. Cl.[5] H01S *3/0915*

U.S. Cl. 250—251 **5 Claims**



1. A non-coherent photoneutralizer comprising a housing that is elongated and elliptical in cross-section, said housing having end members that close the elongated structure, internal surfaces of said end members and internal surfaces of said

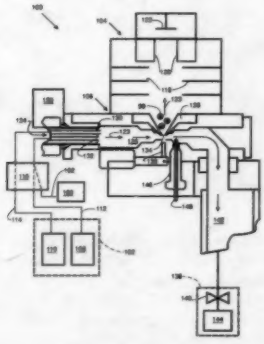
elongated housing being reflective relative to light rays, a fluorescent light source mounted in said elongated body between said end members, and each of said end members having an opening there through with the openings being aligned to allow a ion beam to be projected along a straight line from one end of said elongated housing to the other end of said elongated housing to allow said fluorescent light source to irradiate the ion beam when it is projected through said elongated housing.

4,960,991

MULTIMODE IONIZATION SOURCE

Paul C. Goodley, Cupertino, and Stuart C. Hansen, Palo Alto, both of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Oct. 17, 1989, Ser. No. 422,936
Int. Cl.[5] H01J *49/10*
U.S. Cl. 250—281 **14 Claims**



1. A system comprising:

chamber means for confining an analyte-bearing fluid about a predetermined path;

inlet means for admitting analyte into said chamber, said inlet means providing for the introduction of analyte along said path, said analyte being in a form included in the set consisting of thermospray form and vapor form;

outlet means for permitting ions traveling along said path to exit said chamber, said outlet means having an orifice permitting fluid communication between said chamber means and an ion analyzer, said orifice having an orifice axis, said orifice also having a projection along said axis, said projection having a projection segment within one centimeter of said orifice, said outlet means being coupled to said chamber to permit ions to exit said chamber and enter said ion analyzer;

pressure regulation means for regulating pressure within said chamber;

electron source means for generating free electrons within one centimeter of said projection segment and directing them toward said projection segment; and

a controller for determining the operating mode of said system, said controller alternatively providing for a thermospray ionization mode and an electron impact ionization mode, said controller being coupled to said inlet means so as to determine when analyte-bearing fluid is injected into said chamber in thermospray form and when analyte-bearing fluid is injected into said chamber in gaseous form, said controller being coupled to said pressure regulation means, said controller

when providing for said thermospray ionization mode, causing said pressure regulation means to maintain a relatively high pressure in said chamber and causing said inlet means to introduce analytebearing fluid onto said path in thermospray form, and

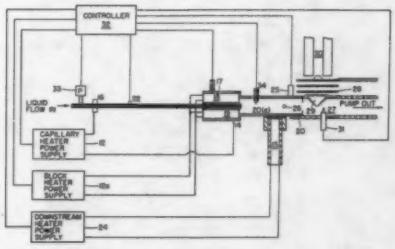
when providing for said electron impact ionization mode, causing said pressure regulation means to establish a relatively low pressure in said chamber and causing said inlet means to introduce analyte-bearing fluid onto said path in gaseous form.

4,960,992

METHOD AND MEANS FOR VAPORIZING LIQUIDS BY MEANS OF HEATING A SAMPLE CAPILLARY TUBE FOR DETECTION OR ANALYSIS

Marvin L. Vestal, Houston; Calvin R. Blakely, Kingwood, both of Tex., and Gordon J. Fergusson, Claremont, Calif., assignors to Research Corporation Technologies, Tucson, Ariz.

Continuation of Ser. No. 31,150, Mar. 25, 1987, which is a continuation of Ser. No. 687,719, Dec. 31, 1984, abandoned, which is a continuation-in-part of Ser. No. 527,751, Aug. 30, 1983, abandoned. This application Mar. 20, 1989, Ser. No. 326,150
The portion of the term of this patent subsequent to Mar. 21, 2006, has been disclaimed.
Int. Cl.[5] H01V *49/28*
U.S. Cl. 250—288 **21 Claims**



1. A thermospray device for vaporizing a liquid sample into an ion vapor containing large molecules of interest for analysis, said device comprising:

(a) a metal capillary tube for receiving said sample, said tube defining a nozzle portion at one end thereof,

(b) heating means for heating said capillary tube to vaporize a predetermined fraction of the sample passing therethrough,

(c) a control means for controlling the temperature of the sample within the capillary and to maintain from 1% to 35% of the sample in liquid form as it is ejected from the nozzle as a particle beam of minute particles entrained in an intense vapor jet, said control means including a means for measuring the temperature of the liquid sample in the capillary tube, said means for measuring including a temperature sensor mounted in thermal contact with the capillary tube within a first third of a predetermined length heated by said heating means, and

(d) a means for separating the large molecules from said vapor jet as said molecules are selected for further analysis.

4,960,993

RADIATING IMAGE READ-OUT AND DISPLAYING APPARATUS

Masao Shigyo, and Eiichi Asai, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Mar. 8, 1989, Ser. No. 320,426
Claims priority, application Japan, Mar. 14, 1988, 63-59611
Int. Cl.[5] G03B *42/00*; G08C *19/00*
U.S. Cl. 250—327.2 **3 Claims**

1. A radiation image read-out and displaying apparatus for

allowing image data gathering and processing instruction entry to be conducted at a first location, and image data processing to be conducted at a second location which is remote from said first location, said apparatus comprising:

(i) an image signal gathering section at said first location, which comprises:

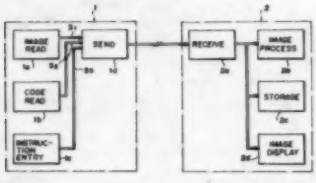
(a) an image read-out means for reading out a recorded radiation image, thereby to obtain an image signal which represents said radiation image,

(b) a code reading means for reading an identification code, which accompanies a radiation image and provides specifics about it, and generating an identification code signal which represents said identification code,

(c) an instruction signal entry means for entering a processing instruction signal, which represents how to process an image signal identified by said identification code signal, and

(d) a signal transmitting means for electronically transmitting said image signal, identification code signal and processing instruction signal sent from said signal sending means and associating said image signal and processing instruction signal with said identification code signal, and

(ii) an image processing and displaying section at said second location and which comprises:



(a) a signal receiving means for receiving said image signal, identification code signal and processing instruction signal sent from said signal sending means and associating said image signal and processing instruction signal with said identification code signal,

(b) an image processing means for carrying out image processing on said image signal received by said signal receiving means, according to said processing instruction signal associated with said image signal by said identification code signal, and for producing a processed image signal,

(c) at least one storage means for storing image data groups which each comprise one of received said image signal, identification code signal and processing instruction signal, and

(d) an image display means for reproducing and displaying a radiation image by use of a processed image signal from said image processing means,

wherein, when an identification code signal and an image signal which correspond to a processing instruction signal entered in advance at said instruction signal entry means are obtained, how said image signal is to be processed at said image processing and displaying section is based on said processing instruction signal.

4,960,994

X-RAY CASSETTE FOR SHEET X-RAY RECEIVING MATERIAL AND METHOD OF PROCESSING THE SAME

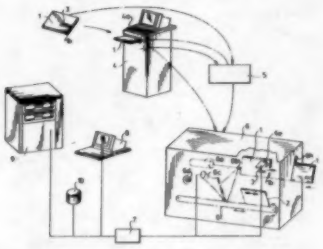
Jürgen Müller, Munich, Fed. Rep. of Germany; Manfred Schmidt, Kirchheim, Fed. Rep. of Germany; Dieter Wauer, Taufkirchen, Fed. Rep. of Germany; Thomas Zehetmaier, Neufarn, Fed. Rep. of Germany; Georges Brys, Beverenwaas, Belgium; Emile Schoeters, Lier, Belgium; Werner Haug, and Walter Bauer, both of Munich, Fed. Rep. of Germany, assignors to Agfa-Gevaert AG, Leverkusen, Fed. Rep. of Germany

Filed Aug. 29, 1988, Ser. No. 238,035

Claims priority, application Fed. Rep. of Germany, Sep. 17, 1987, 3731204

Int. Cl.[5] A61B *6/00*

U.S. Cl. 250—327.2 **16 Claims**



1. A cassette for an X-ray sensitive sheet-like material, comprising a memory rigidly attached to the cassette and located in a position spaced by a given distance from a predetermined corner of the cassette, which is the same for all cassettes of the same type but different formats, said memory carrying storable, recordable, readable and erasable data in digital form, wherein said material is a film coated with a stimulable phosphor layer, said memory having a changeable memory portion by which a number of exposures and evaluations and erasings of said film is countable and which is reset to zero when a film in the cassette is exchanged.

4,960,995

RADIATION DETECTOR

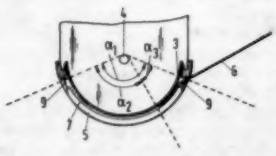
Adalbert Neumann, Hagen, and Heinrich Stumpf, Schalksmühle, both of Fed. Rep. of Germany, assignors to Asea Brown Boveri Aktiengesellschaft, Mannheim, Fed. Rep. of Germany

Filed Dec. 27, 1988, Ser. No. 290,022

Claims priority, application Fed. Rep. of Germany, Dec. 24, 1987, 3744182

Int. Cl.[5] G01J *5/04, 5/06, 5/08*

U.S. Cl. 250—347 **14 Claims**



1. Radiation detector, serving as an infrared movement monitor, which is reactive to thermal radiation, comprising a housing having a window admitting the radiation, optics, the window having a size being coordinated with the angle of coverage of the optics disposed behind it, the optics focussing the radiation onto an optical sensor, preferably through a

Fresnel lens, the window having a frame for accepting and guiding at least one masking element formed of a strip-shaped plastic film diminishing the infrared radiation and being slideably displaceable in a guide channel along the window for covering the optics in a variable sub-region thereof.

4,960,996

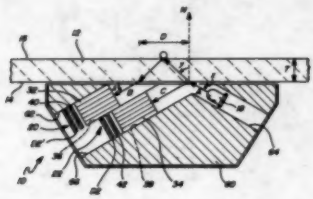
RAIN SENSOR WITH REFERENCE CHANNEL

Peter A. Hochstein, 2966 River Valley Dr., Troy, Mich. 48098

Filed Jan. 18, 1989, Ser. No. 298,419

Int. Cl.[5] G01N *21/47*

U.S. Cl. 250—349 **19 Claims**



1. A sensing assembly for indicating when moisture or other particles have accumulated on a window having inside and outside surfaces, said assembly comprising; emitter means (18) for disposition on the inside of the window (12) to emit radiant energy to the window (12) on an ingress axis (A), detector means (20) for disposition on the inside of the window (12) to detect radiant energy emitted by said emitter means (18) and received along an egress axis (B) extending from the window (12), and characterized by including reference detector means (22) for disposition on the window (12) to receive radiant energy directed by the window (12) and emitted by said emitter means (18) and to detect the magnitude of said radiant energy.

4,960,997

OPTICAL WINDOW AND RADIATION POSITION-SENSITIVE DETECTOR USING THE SAME

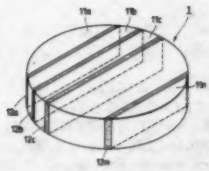
Mitsuo Watanabe, and Toshihiko Sawai, all of Shizuoka, Japan, assignors to Hamamatsu Photonics Kabushiki Kaisha, Shizuoka, Japan

Filed Jan. 18, 1989, Ser. No. 299,161

Claims priority, application Japan, Jan. 19, 1988, 63-9006

Int. Cl.[5] G01T *1/20*; G02B *6/26*

U.S. Cl. 250—368 **9 Claims**



7. A radiation position-sensitive detector, comprising:

a scintillator for emitting first light in response to absorption of an incident radiation;

an optical window for receiving said first light with one of a plurality of glass members and outputting second light from the same glass member, said optical member comprising:

said plurality of glass members; and

a plurality of reflective members each being formed between adjacent ones of said glass members, each of said reflective members comprising: a glass medium which is the same as said glass member; and grain regions made of a material different from said glass medium and interspersed in said glass medium; and

a multi-anode type photomultiplier tube having a plurality of photomultipliers for detecting said second light.

4,960,998

METHOD AND APPARATUS FOR CONTINUOUSLY DETERMINING GAS-CARRIED ALPHA-RADIOACTIVITY

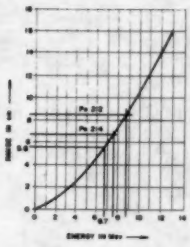
Juergen Peter, Hauckwaldstrasse 10, D-8755 Alzenau, Fed. Rep. of Germany

Filed Jul. 25, 1989, Ser. No. 384,755

Claims priority, application Fed. Rep. of Germany, Jul. 25, 1988, 3825205

Int. Cl.[5] G01T *1/24, 1/00*

U.S. Cl. 250—432 R **5 Claims**



1. A method for determining the gas-carried alpha radioactivity caused by the decay of thorium, uranium, plutonium and their decay products, in the form of the difference between the total gas-carried alpha activity and the gas-carried alpha activity of the radon 220 or radon 222 decay chains or mixtures thereof comprising in order to determine the gas-carried alpha activity of the radon 220 and/or radon 222 decay chains, measuring the nuclides polonium 212 and/or polonium 214, or mixtures thereof after absorbing the alpha rays of all the other nuclides in an absorber capable thereof, measuring the alpha activity of radon 220 and polonium 216, and computing the gas-carried alpha activity of the radon 220 or radon 222 decay chains or mixtures thereof.

4,960,999

SCANNING AND STORAGE OF ELECTROPHORETIC RECORDS

Ronald A. McKean, Royal Oak, and Jeff Stiegman, Ann Arbor, both of Mich., assignors to KMS Fusion, Inc., Ann Arbor, Mich.

Filed Feb. 13, 1989, Ser. No. 309,104

Int. Cl.[5] G01N *21/64, 27/26*

U.S. Cl. 250—461.1 **31 Claims**

1. Apparatus for analyzing an electrophoretic record that includes at least one gel separation, said apparatus comprising:

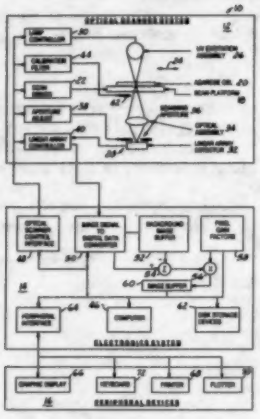
means for mounting the record and moving the record in a predetermined direction with respect to the separation on the record,

a light source positioned with respect to said record-mounting means to illuminate at least a portion of the record,

a camera comprising a plurality of light-responsive elements disposed in a linear array positioned with respect to said mounting means such that said camera has a linear field of view of a portion of the record on said mounting means illuminated by said light source and orthogonal to said predetermined direction,

means for scanning said plurality of light-responsive ele-

ments at increments of motion of the record across said field of view to develop a series of signals from each said



element corresponding to intensity of light at each said element at each said increment, and

means for electronically storing said plurality of signals.

4,961,000

CASSETTE FOR AN X-RAY LUMINESCENT STORAGE SCREEN

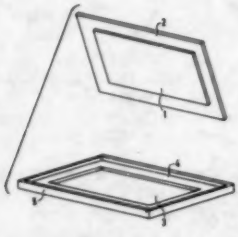
Johann Finkenzeller, Erlangen, and Guenter Hubert, Baiersdorf, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jun. 19, 1989, Ser. No. 367,672

Claims priority, application Fed. Rep. of Germany, Jun. 21, 1988, 8807986[U]

Int. Cl.[5] G03B *42/04*

U.S. Cl. 250—484.1 **8 Claims**



1. An x-ray cassette comprising:

a housing having at least regions thereof consisting of ferromagnetic material;

a cover for closing said housing, said cover being completely separable and removable from said housing and consisting of flexible ferromagnetic material;

a luminescent storage screen for storing a latent x-ray image attached to said cover so that when said cover closes said housing, said screen is disposed within said housing and when said cover is removed from said housing said luminescent storage screen is removed therewith; and at least of said cover or said housing regions being magnetized.

4,961,001

METHOD FOR COMPENSATING FOR ENVIRONMENTAL PARAMETERS ON THE IMAGING CHARACTERISTICS OF AN OPTICAL SYSTEM

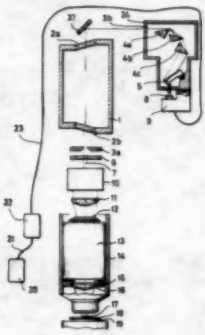
Jürgen Liegel, Oberkochen, and Martin Krautter, Heidenheim, both of Fed. Rep. of Germany, assignors to Carl-Zeiss-Stiftung, Heidenheim, Fed. Rep. of Germany

Filed Oct. 6, 1988, Ser. No. 254,433

Claims priority, application Fed. Rep. of Germany, Oct. 7, 1987, 3733823

Int. Cl.[5] G01J *1/00*; G01N *21/00*

U.S. Cl. 250—491.1 **16 Claims**



1. A method for compensating for the influence of environmental parameters on the imaging characteristics of a system for imaging an original into an image plane by utilizing narrow-band radiation having a predetermined wavelength, the method comprising the steps of:

first determining the influence of at least one of the environmental parameters on the imaging characteristics and storing the same in the form of stored values;

continuously measuring said at least one environmental parameter during operation of the system;

converting one at least one environmental parameter into a positioning quantity by means of said stored values for readjusting the wavelength of the radiation of said system so as to cause the original to be imaged precisely into said image plane; and,

influencing a part of said system with said positioning quantity so as to cause said imaging characteristics to be maintained constant with a high precision.

4,961,002

SYNAPSE CELL EMPLOYING DUAL GATE TRANSISTOR STRUCTURE

Simon M. Tam, Redwood City; Mark A. Holler, Palo Alto, and Hernan A. Castro, Shingle Springs, all of Calif., assignors to Intel Corporation, Santa Clara, Calif.

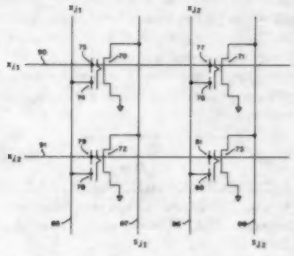
Continuation-in-part of Ser. No. 379,933, Jul. 13, 1989. This application Oct. 11, 1989, Ser. No. 419,685

Int. Cl.[5] H03K *19/21*

U.S. Cl. 307—201 **16 Claims**

1. A synapse cell for discharging a neural summing line in an associative network, the discharge rate being a function of the duration of an input voltage pulse and a stored weight, said cell comprising a dual-gate transistor having a floating gate for storing said stored weight, a source coupled to a reference potential, a drain coupled to said neural summing line, a first control gate coupled to a first input line and a second control

gate coupled to a second input line, said first and/or said input lines coupling said input voltage pulse to said dual-gate transis-



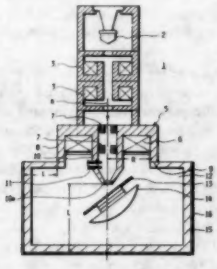
tor to cause a current to flow from said drain to said source, said current discharging said neural summing line.

4,961,003

SCANNING ELECTRON BEAM APPARATUS

Akira Yonezawa, Koto, Japan, assignor to Seiko Instruments, Inc., Chiba, Japan

Filed Nov. 1, 1989, Ser. No. 430,355
Claims priority, application Japan, Nov. 5, 1988, 63-279987
Int. Cl.[5] H01J *37/09*
U.S. Cl. 250—398 **4 Claims**



1. Apparatus for directing a scanned electron beam to a sample along an axis, comprising: a single-pole objective magnetic lens for focusing the scanned electron beam onto the sample, said objective magnetic lens including a central pole portion extending along the axis and having an axial end face, said lens being operative to generate a magnetic field for focusing the scanned electron beam onto the sample, said lens further including a peripheral sleeve portion extending along the axis and having a peripheral edge face effective to form a magnetic circuit between said end face and said peripheral edge face, said peripheral sleeve portion having an inner radius R; and a magnetic shield member disposed to surround, and magnetically shield the sample, said magnetic shield member having a central section spaced axially from said end face of said pole portion by a distance L which is not substantially less than R so that said magnetic shield member is not magnetically coupled to said magnetic circuit, and said shield member having a peripheral section spaced from said peripheral edge face of said peripheral sleeve by a distance sufficient to magnetically isolate said magnetic shield member from said magnetic lens.

4,961,004

X-RAY INTENSIFYING SCREEN INCLUDING A TITANIUM ACTIVATED HAFNIUM DIOXIDE PHOSPHOR CONTAINING SAMARIUM TO REDUCE AFTERGLOW

Philip S. Bryan, Webster; Patrick M. Lambert; Christine M. Towers, both of Rochester, and Gregory S. Jarrold, Henrietta, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 305,222, Feb. 3, 1989. This application Nov. 16, 1989, Ser. No. 437,465
Int. Cl.[5] C09K *11/67*
U.S. Cl. 250—483.1 **10 Claims**

1. A screen comprised of

a support and

a fluorescent layer containing a phosphor capable of absorbing X-radiation and emitting longer wavelength electromagnetic radiation comprised of monoclinic crystals of a titanium activated hafnium dioxide phosphor host,

characterized in that the monoclinic crystals consist essentially of oxygen and combined elements satisfying the relationship

$$Hf_{1-z}Zr_zTi_xM_ySm_w$$

wherein

M represents at least one alkali metal;

w is in the range of from 1×10^{-4} to 5×10^{-3};

x is in the range of from 3×10^{-4} to 1.0;

y is up to 1; and

z is up to 0.3,

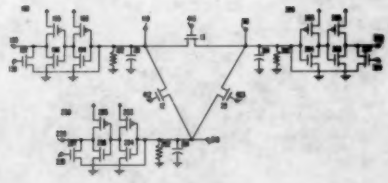
the phosphor exhibiting a reduced afterglow when excited by X-radiation as compared to the phosphor as defined above absent samarium.

4,961,005

PROGRAMMABLE NEURAL CIRCUIT IMPLEMENTABLE IN CMOS VERY LARGE SCALE INTEGRATION

Fathi M. A. Salam, Okemos, Mich., assignor to Board of Trustees operating Michigan State University, East Lansing, Mich.

Filed Apr. 25, 1989, Ser. No. 343,080
Int. Cl.[5] G06G *7/12*; H03K *3/027, 19/20*; G11C *27/02*
U.S. Cl. 307—201 **12 Claims**



1. A neural network circuit comprising:

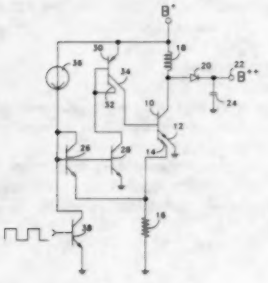
a plurality of neuron circuits, each neuron circuit having an input node for receiving an input signal, an output node for generating an output signal and a self-feedback control node for receiving a self-feedback signal, said output signal of each neuron circuit being a function of said input signal and said self-feedback signal; and

a plurality of interconnection devices, one interconnection device connected between said input nodes of each pair of neuron circuits, each interconnection device having an electrically controllable nonlinear conductance.

4,961,006
INDUCTIVELY LOADED SWITCHING TRANSISTOR CIRCUIT

Gary L. Pace, and David H. Overton, both of Boca Raton, Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jun. 22, 1989, Ser. No. 369,877
Int. Cl.[5] H03K *3/01, 17/60;* **G05F** *1/40, 3/16*
U.S. Cl. 307—270 **10 Claims**

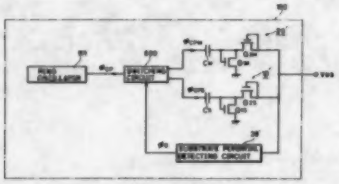


1. An inductively loaded switching circuit, comprising:
an inductive load;
switching transistor means coupled to said inductive load for conducting current flowing through said inductive load when said switching transistor is in a conductive state, said switching transistor means having a first emitter for coupling to a first source of supply voltage, and having a second emitter;
a drive circuit coupled to said switching transistor means for supplying a drive current thereto; and
feedback means coupled to said second emitter and to said drive circuit for varying said drive current.

4,961,007
SUBSTRATE BIAS POTENTIAL GENERATOR OF A SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE AND A GENERATING METHOD THEREFOR

Masaki Kumanoya; Yasuhiro Konishi; Katsumi Dosaka; Takahiro Komatsu, and Youichi Tobita, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 12, 1989, Ser. No. 337,218
Claims priority, application Japan, Dec. 8, 1988, 63-312415
Int. Cl.[5] H03K *3/01*
U.S. Cl. 307—296.2 **17 Claims**

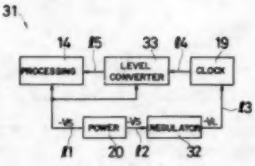


17. A substrate bias potential generator of a semiconductor integrated circuit device, for applying a predetermined bias potential to a semiconductor, substrate having a surface where a semiconductor circuit is formed, comprising:
first potential generating means having relatively large current supply capability and an output coupled to said semiconductor substrate;
second potential generating means having relatively small current supply capability and an output coupled to said semiconductor substrate;
detection means having an input coupled to said semiconductor substrate, for detecting a potential of said semiconductor substrate through said input, said detection means having an output signal which is dependent upon the detected substrate potential; and
means responsive to said output signal for selectively activating either said first or second, not both, potential generating means.

4,961,008
POWER REDUCTION DURING POWER DOWN

Toshiaki Fujiwara, 759-22, Sugawara-cho, Nara-shi, Nara-ken, and Chieji Katoh, 492, Minosho-cho, Yamatokoriyama-shi, Nara-ken, both of Japan

Filed Dec. 28, 1988, Ser. No. 291,226
Claims priority, application Japan, Dec. 29, 1987, 62-199191[U]
Int. Cl.[5] H03K *3/01, 5/13*
U.S. Cl. 307—296.3 **10 Claims**



1. An electric circuit comprising:
a power supply operable to provide electric power;
power reducing means for reducing the electric power from the power supply operatively connected to the power supply;
a first operating circuit for delivering a signal, said first operating circuit always energized with the electric power from the power reducing means and being operatively connected to the power reducing means;
level converting means for converting the signal from the first operating circuit to increase the signal's crest value, energized with electric power from the power supply; and
a second operating circuit for operating in response to a signal from the level converting means, energized for operation with electric power from the power supply in one period of time, and not energized or operation with electric power from the power supply in another period of time, the one and another periods of time being different time periods.

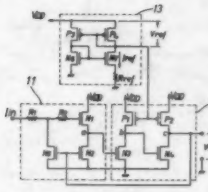
4,961,009
CURRENT-VOLTAGE CONVERTING CIRCUIT UTILIZING CMOS-TYPE TRANSISTOR

Woo H. Baik, Seoul, Rep. of Korea, assignor to Goldstar Semiconductor, Ltd., Seoul, Rep. of Korea

Filed Jun. 20, 1989, Ser. No. 369,038
Claims priority, application Rep. of Korea, Jun. 29, 1988, 10253/1988
Int. Cl.[5] H03K *3/027, 3/013, 17/687, 3/01*
U.S. Cl. 307—296.8 **1 Claim**

1. A current-voltage converting circuit utilizing a CMOS-type transistor, which comprises:
a buffer circuit (11) which is composed of resistors (R_1, R_2) and N-channel transistors (N_1,N_2,N_5) and buffers and amplifies a current being input to an input terminal (I_{in});
a gain circuit (12) which is constituted in a 2-step inverter form so as to have a current source load by P-channel transistors (P_1,P_2) and N-channel transistors (N_3,N_4) and outputs a voltage in proportion to the output voltage of

said buffer circuit (11) and feedbacks the output voltage to gates of N-channel transistors (N_2,N_5) of said buffer circuit (11); and



a current reference circuit (13) which is constituted in a current mirror by P-channel transistors (P_3,P_4), N-channel transistors (N_6,N_7) and a reference voltage (V_{ref}) and supplies a constant voltage to gates of the P-channel transistors (P_1,P_2) of the gain circuit (12).

4,961,010

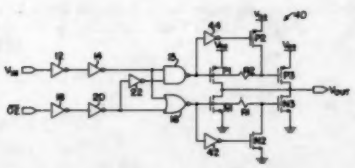
OUTPUT BUFFER FOR REDUCING SWITCHING INDUCED NOISE

Jeffrey B. Davis, Raymond, Me., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Filed May 19, 1989, Ser. No. 355,509

Int. Cl.[5] **H03K** *17/16, 19/094, 5/12*

U.S. Cl. 307—443 **24 Claims**



1. An output buffer for reducing switching induced noise in high speed integrated circuit devices, said output buffer having an input for receiving data signals of high and low potential, an output for delivering data signals propagated through the output buffer, a relatively large current carrying capacity primary pulldown transistor element operatively coupled at the output for sinking a relatively large discharge current from the output to ground, and a relatively large current carrying capacity primary pullup transistor element operatively coupled at the output for sourcing a relatively large charging current to the output from a power supply, each transistor element being characterized by a sourcing or sinking current path between first and second terminal leads, and a third control terminal lead for controlling the conducting state of the current path, the improvement comprising:

a relatively small current carrying capacity secondary pulldown transistor element having its current path first and second terminal leads coupled in parallel with the current path first and second terminal leads of the primary pulldown transistor element;

and a separate pulldown delay resistor component element of selected resistance value operatively coupled in series between the control terminal leads of the secondary and primary pulldown transistor elements for turn on of the primary pulldown transistor element a specified time delay after the secondary pulldown transistor element during transition from high to low potential at the output;

said secondary pulldown transistor element control terminal lead being coupled in the output buffer to receive a signal propagating through the output buffer before the primary pulldown transistor element control terminal lead to initiate a relatively small discharge current from the output before turn on of the relatively large discharge current of the primary pulldown transistor element;

the ratio of current carrying capacities of the primary and secondary pulldown transistor elements and the resistance value of the pulldown delay resistor component element being selected so that the first positive ground rise in potential (first ground bounce) caused by turn on of the secondary pulldown transistor element and the second positive ground rise in potential (second ground bounce) caused by turn on of the primary pulldown transistor element, are substantially equal.

4,961,011

BIMOS CURRENT MIRROR

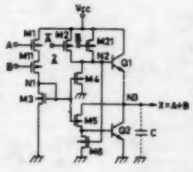
Akira Ide, and Yoshikazu Saito, both of Takasaki, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 262,290, Oct. 25, 1988, Pat. No. 4,883,988, which is a continuation-in-part of Ser. No. 946,777, Dec. 29, 1986, abandoned. This application Sep. 12, 1989, Ser. No. 406,236

Claims priority, application Japan, Dec. 27, 1985, 60-292667

Int. Cl.[5] **H03K** *19/02, 19/094*

U.S. Cl. 307—446 **11 Claims**



1. A semiconductor integrated circuit device comprising:

first and second power supply terminals for supplying first and second operating voltages, respectively, to said semiconductor integrated circuit device;

first and second input terminals for receiving respective first and second input signals, said second input signal being reversed in phase relative to said first input signal;

an output terminal;

a first bipolar transistor coupled to have its collector-emitter path coupled between said first power supply terminal and said output terminal, wherein said first bipolar transistor executes one of charging and discharging of an output capacitance of said output terminal;

means coupled between said output terminal and said second power supply terminal and for executing the other of charging and discharging of said output capacitance;

a current mirror coupled to said second power supply terminal and having an input node for receiving an input current and an output node directly connected to a base of said first bipolar transistor, wherein said current mirror provides an output current at said output node thereof in response to a supply of said input current to said input node thereof so as to execute one of charging and discharging of a base capacitance of said first bipolar transistor;

a first MOSFET having a channel of a first conductivity type coupled to have its source-drain path coupled between said first power supply terminal and said input node of said current mirror, and further coupled to have its gate coupled to said first input terminal, wherein said first MOSFET provides said input current to said input node of said current mirror in response to said first input signal; and

a second MOSFET having a channel of the first conductivity type coupled to have its source-drain path connected between said first power supply terminal and said base of

said first bipolar transistor, and further coupled to have its gate coupled to said second input terminal, wherein said second MOSFET executes the other of charging and discharging of the base capacitance of said first bipolar transistor in response to said second input signal;

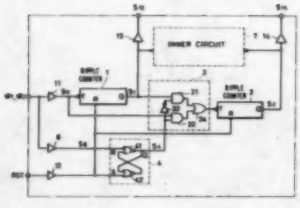
wherein said means includes an N-channel MOSFET having a gate coupled to receive a signal reversed in phase from a signal appearing at the base of said first bipolar transistor and a source-drain path coupled between said output terminal and said second power supply terminal.

4,961,012

SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE RESPONSIVE TO CLOCK SIGNALS HAVING DIFFERENT AMPLITUDES

Kazuharu Nishitani, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 26, 1989, Ser. No. 302,033
Claims priority, application Japan, Feb. 8, 1988, 63-26900
Int. Cl.[5] G06F *7/38*
U.S. Cl. 307—465 **9 Claims**



1. A semiconductor integrated circuit device comprising:

clock signal receiving means for receiving either a first clock signal having an amplitude of a first voltage level or a second clock signal having an amplitude of a second voltage level lower than the first voltage level;

first circuit means coupled to said clock signal receiving means through a selector circuit means for operating in response to the first or second clock signal;

detecting means connected to said clock signal receiving means for detecting a voltage level of the amplitude of the clock signal; and

control signal generating means for generating a control signal to control said selector circuit means in response to said detecting means,

said selector circuit means operating in response to the control signal from said control signal generating means.

4,961,013

APPARATUS FOR GENERATION OF SCAN CONTROL SIGNALS FOR INITIALIZATION AND DIAGNOSIS OF CIRCUITRY IN A COMPUTER

John R. Obermeyer, Jr., Campbell; John F. Shelton, Aptos, and Donald A. Williamson, Cupertino, all of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Oct. 18, 1989, Ser. No. 423,306
Int. Cl.[5] H03K *19/02, 17/16*
U.S. Cl. 307—480 **5 Claims**

1. A circuit for controlling scan data with reduced numbers of scan control lines, said circuit comprising:

a delay line;

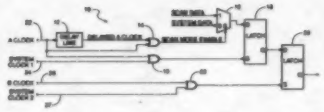
a two-input multiplexer for system data and scan data;

a first clocked latch; and

a first OR gate;

said delay line being coupled to receive a first clock input signal to produce a delayed first clock output signal, said first OR gate being coupled to receive said delayed first clock output signal and said first clock input signal to yield a scan mode enable signal;

said multiplexer being coupled to receive as a control input said scan mode enable signal from said first OR gate; and



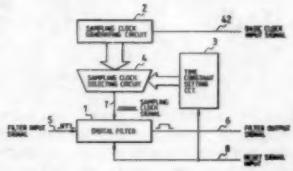
said first clock latch having a data input coupled to a data output of said multiplexer and a strobe input coupled to receive a clock signal.

4,961,014

FILTER CIRCUIT UTILIZING REVERSIBLE COUNTER FOR GENERATING A SATISFACTORY HYSTERESIS

Toshiro Kasahara, 2-4-15 Koushi Niigatashi, Niigata, Japan

Filed Feb. 13, 1989, Ser. No. 309,423
Claims priority, application Japan, May 26, 1988, 63-127183
Int. Cl.[5] H03B *1/00;* H03K *9/06*
U.S. Cl. 307—520 **19 Claims**



1. A filter circuit comprising:

clock signal generating means for generating a sampling clock signal;

a reversible counter connected to said clock signal generating means and including means for sampling an input signal, which changes between high and low levels, in response to the sampling clock signal generated by said clock signal generating means and for performing a count-up operation when a sampled value of said input signal is at the high level and a count-down operation when a sampled value of said input signal is at the low level;

first control means coupled to said reversible counter for detecting a first threshold value of a count by said reversible counter and for setting the count of said reversible counter to a value equal to said first threshold value plus a predetermined value when said count is incremented over said first threshold value;

second control means coupled to said reversible counter for detecting a second threshold value of the count by said reversible counter and for setting the count of said reversible counter to a value equal to said second threshold value less said predetermined value when said count is decremented below said second threshold value; and

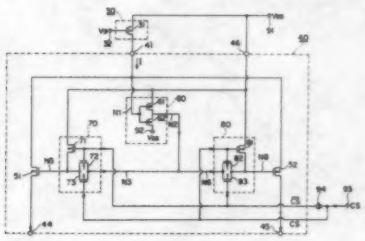
means for providing an output of said reversible counter as a filter circuit output.

4,961,015

MOS CURRENT SWITCHING CIRCUIT

Yasuhiro Shin, and Kazuo Kobayashi, both of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed Mar. 3, 1989, Ser. No. 319,216
Claims priority, application Japan, Mar. 7, 1988, 63-52912
Int. Cl.[5] H03K *17/687, 3/01, 17/16*
U.S. Cl. 307—572 **9 Claims**



1. A MOS current switching circuit comprising:

an input current terminal connected to a current source for receiving a constant current therefrom, said current source being connected to a first power supply voltage;

a pair of output current terminals for supplying an output current;

a first main MOSFET having a gate electrode, a first electrode connected to said input current terminal and a second electrode connected to one of said output current terminal;

a second main MOSFET having a gate electrode, a first electrode connected to said input current terminal and a second electrode connected to the other of said output current terminals;

an inverting amplifier connected to the input current terminal for providing a feedback bias voltage signal, said inverting amplifier being connected between said first power supply voltage and a second power supply voltage to thereby receive a power supply;

means for providing first and second control signal each having first and second logic levels such that said first control signal is at the first logic level while said second control signal is at the second logic level and said first control signal is at the second logic level while said second control signal is at the first logic level;

a first control circuit having a first control MOSFET and a first switching element;

said first control MOSFET having a gate electrode connected to one of said control signals, a first electrode connected to the first power supply voltage, and a second electrode connected to said gate electrode of said first main MOSFET;

said first switching element having a control electrode connected to one of said control signals, said first control MOSFET being turned on while said first switching element is turned off, and said first control MOSFET being turned off while said first switching element is turned on, said first switching element also including a first electrode connected to said inverting amplifier for carrying the feedback bias voltage signal, and a second electrode selectively connectable to said first electrode and connected to said gate electrode of said first main MOSFET for supplying the feedback bias voltage signal from said inverting amplifier to said gate electrode;

a second control circuit having a second control MOSFET and a second switching element;

said second control MOSFET having a gate electrode connected to one of said control signals, a first electrode connected to the first power supply voltage, and a second electrode connected to said gate electrode of said second main MOSFET;

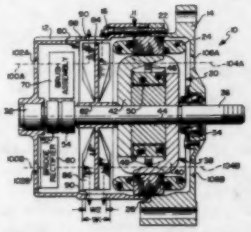
said second switching element a control electrode connected to one of said control signals, said second control MOSFET being turned on while said second switching element is turned off, and said second control MOSFET being turned off while said second switching element is turned on, said second switching element also including a first electrode connected to said inverting amplifier for carrying the feedback bias voltage signal, and a second electrode selectively connectable to said first electrode and connected to said gate electrode of said second main MOSFET for supplying the feedback bias voltage signal from said inverting amplifier to said gate electrode, such that said first and second main MOSFETs are both biased by the same feedback bias voltage signal.

4,961,016

DUAL-FACE COOLING FAN FOP A DYNAMOELECTRIC MACHINE

Yuchi P. Peng, Noblesville; Melvin H. Hallmann, Middletown, and Robert W. Ward, Anderson, all of Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Aug. 9, 1989, Ser. No. 394,982
Int. Cl.[5] H02K *9/06*
U.S. Cl. 310—62 **2 Claims**



1. A dynamoelectric machine comprising:

(a) a housing having ventilated first and second end frames, wherein the second end frame includes a cylindrical portion having a plurality of circumferential vents;

(b) fastener means for removably connecting the first and second end frames;

(c) a stator assembly and a rotor assembly mounted in a chamber formed by the first end frame, the rotor assembly including a rotatable shaft extending into a chamber formed by the second end frame;

(d) heat-generating means mounted in the chamber formed by the second end frame;

(e) a dual-face cooling fan assembly having a sleeve portion mounted on the shaft in the chamber formed by the second end frame so that the fan assembly is mounted between the stator and rotor assemblies and the heat-generating means and adjacent the cylindrical portion of the second end frame, the fan assembly including

(i) a divider disk mounted on the sleeve portion having a diameter slightly less than the inner diameter of the cylindrical portion, and

(ii) a plurality of blades provided on each surface of the disk wherein the blades extend to a diameter slightly less than the inner diameter of the cylindrical portion;

whereby as the fan assembly rotates with the shaft, a plurality of separate air currents are drawn axially through the housing from opposite end frames into the divider disk and then radially expelled from the housing through the circumferential vents without substantial mixing of the air currents.

4,961,017

STATOR FOR USE IN A BRUSHLESS MOTOR

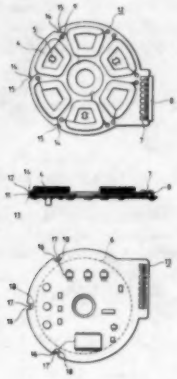
Wataru Kakinoki; Noriaki Miyoshi, and Koji Arai, all of Tokyo, Japan, assignors to Akai Electric Co., Ltd., Tokyo, Japan

Filed Sep. 26, 1988, Ser. No. 248,826

Claims priority, application Japan, Sep. 28, 1987, 62-240794; Oct. 7, 1987, 62-251722

Int. Cl.[5] H02K *11/00, 1/22*

U.S. Cl. 310—71 **15 Claims**



1. A stator for use in a brushless motor having a rotor, comprising:

a stator yoke having a first surface, and a second surface opposite said first surface;

a first printed substrate fixedly mounted on said first surface of said stator yoke;

a second printed substrate fixedly mounted on said second surface of said stator yoke, said second printed substrate being provided separately from said first printed substrate;

means for controlling driving of said brushless motor, said motor driving control means being mounted on said second printed substrate and electrically connected thereto; and

a plurality of drive coils mounted on said first printed substrate and electrically connected thereto, an end of each of said drive coils to be connected to said motor driving control means being directly connected to said motor driving control means and being connected directly to said second printed substrate, wherein said stator is formed with at least one notch through which a part of said drive coils passes and through which said end of said coils is directly connected to said motor driving control means, and wherein said yoke is smaller in diameter than said first printed substrate so that said part of said drive coils does not contact with said stator yoke.

4,961,018

ENCLOSED PUMP MOTOR AND WIRING THEREOF

Pervez Akhter, Fort Wayne, Ind., assignor to Wayne/Scott Fetzer Company, Fort Wayne, Ind.

Filed Aug. 11, 1989, Ser. No. 393,399

Int. Cl.[5] H02K *7/08;* **H01H** *35/40;* **H01R** *13/52;* **F04B** *49/04*

U.S. Cl. 310—87 **18 Claims**

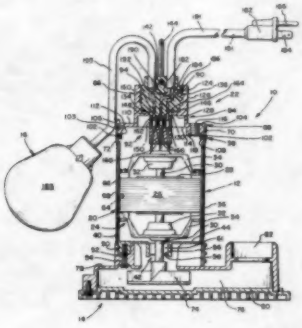
1. An enclosed pump motor comprising:

a cylindrical motor housing having a motor receiving end and a closed motor shaft end, a motor shaft hole formed in said closed motor shaft end;

a motor having a motor shaft received in said housing, said shaft extending through said motor shaft hole;

a motor cover on said motor receiving end of said housing, said cover having a threaded bore therethrough communicating with the interior of said housing;

a threaded grommet threadingly engaging and received in said threaded bore; and,



first and second electrical conductors, at one end, adapted to be connected to an electrical power source and, at the other end, extending through said grommet and connected to said motor, whereby electrical power is provided to said motor.

4,961,019

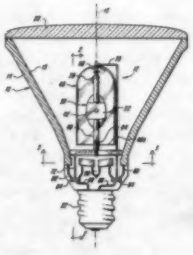
METAL HALIDE LAMP ASSEMBLY

Robert S. White, Beverly; Elliot F. Wyner, West Peabody, and John A. Scholz, Danvers, all of Mass., assignors to GTE Products Corporation, Danvers, Mass.

Filed Oct. 14, 1988, Ser. No. 257,606

Int. Cl.[5] H01J *17/02, 61/34*

U.S. Cl. 313—25 **32 Claims**



1. An electric lamp comprising:

a lamp envelope having a base region including a base for connection to an electrical source;

an arc tube having an upper electrode lead and a lower electrode lead extending from opposite ends thereof;

an arc tube support strap attached to one end of said arc tube;

bulb spacer means coupled to said support strap for positioning said arc tube relative to said lamp envelope;

a light-transmissive shroud substantially surrounding said arc tube and abutting against said support strap;

an upper electrode support coupled to the upper electrode lead of said arc tube and extending outside said shroud to said base; and

a lower electrode support coupled to the lower electrode lead of said arc tube and extending to said base, said upper and lower electrode supports providing mechanical support of said arc tube in said lamp envelope, coupling electrical energy to said arc tube and being electrically

isolated from the remainder of said lamp, said arc tube and said shroud being mechanically supported in said lamp envelope entirely from the base region of said lamp envelope.

4,961,020

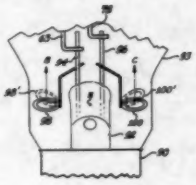
SODIUM VAPOR LAMP FOR SONIC PULSE OPERATION

Jack M. Strok, Garrettsville, Ohio, assignor to General Electric Company, Schenectady, N.Y.

Filed Mar. 3, 1989, Ser. No. 318,275

Int. Cl.[5] H01J *17/24*

U.S. Cl. 313—025 **22 Claims**



1. A jacketed high pressure sodium vapor lamp for operation at low noise levels on sonic pulses of short duty cycle comprising in combination:

(a) an elongated light transmissive ceramic arc tube having conductive electrode supporting closures sealed to opposite ends and containing an ionizable filling including sodium, said electrodes and closures comprising only non-magnetrostrictive metal,

(b) an evacuated outer vitreous light transmitting envelope surrounding the arc tube, the outer envelope having a vitreous stem at one end including a press region through which extends a pair of inleads, at least one ring getter element including a vaporizable barium substance being physically supported in the vicinity of the inleads so that a normal line extending from the plane in which the inleads reside lies substantially perpendicular with respect to a normal line extending from the plane in which the ring getter element resides, the orientation of said ring getter element relative to said inleads reducing the acoustic coupling therebetween, and

(c) a metal wire frame within the outer envelope physically supporting and making electrical connection to the arc tube, the frame comprising a long side rod extending from the inner portion of one inlead toward the other end of the outer envelope, and a shorter length of rod extending from the inner portion of the other inlead, both rods being of a non-magnetostrictive metal.

4,961,021

CONVERGENCE APPARATUS AND CONVERGENCE YOKE USED THEREFOR

Hiroki Oguro; Nobutaka Okuyama, and Masaki Nakahara, all of Yokohama, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 31, 1989, Ser. No. 304,213

Claims priority, application Japan, Feb. 3, 1988, 63-21898

Int. Cl.[5] H01J *27/70, 29/76*

U.S. Cl. 313—412 **16 Claims**

1. A convergence apparatus comprising:

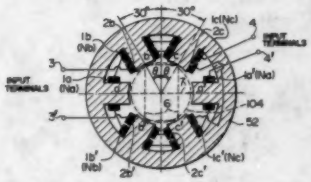
a ring-like core having a ring-like portion and a plurality of core protrusions provided on an inside surface of said ring-like portion so as to project beyond said ring-like portion toward the center of said ring-like core;

a plurality of coils respectively wound on said core protrusions;

a convergence circuit for supplying said coils with convergence correction currents;

said plurality of core protrusions being arranged so as to form at least two magnetic poles so that a bipolar magnetic field in the direction along at least one of a horizontal and a vertical axis of said core is generated by said two magnetic poles;

each of said at least two magnetic poles including a selected one of said plurality of core protrusions located on said at least one of said horizontal and said vertical axis and at least two additional core protrusions of said plurality of



core protrusions located at positions equiangularly and symmetrically deviated from said at least one of said horizontal and said vertical axis; and

wherein a ratio of an ampere turn of the coil wound on each of said at least two additional core protrusions to an ampere turn of the coil wound on said selected core protrusion is made variable so as to make adjustable an uneven magnetic field component of said bipolar magnetic field.

4,961,022

DISPLAY TUBE INCLUDING A HELICAL FOCUSING LENS WITH A NON-ROTATIONALLY SYMMETRICAL LENS ELEMENT

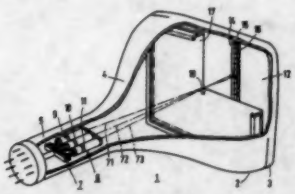
Gerardus J. A. Hellings; Antonius W. F. Van Der Heijden; Erich E. Himmelbauer; Gerardus A. H. M. Vrijssen; Tjerk G. Spanjer; Willem M. Van Alphen, and Jeroen Van Engelshoven, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 24, 1989, Ser. No. 342,413

Claims priority, application Netherlands, May 20, 1988, 8801308

Int. Cl.[5] H01J *29/62*

U.S. Cl. 313—414 **8 Claims**



1. A display tube having an envelope, comprising a phosphor screen on one side and a neck portion on the other side, and an electron gun positioned in the neck portion and comprising a beam-shaping part for producing an electron beam, and a focusing structure for focusing the produced electron beam on the phosphor screen, characterized in that the focusing structure comprises an elongate hollow structure having an inner surface and an outer surface and having a high-ohmic layer of resistive material provided on at least one of said surfaces, which layer operates as a voltage divider, and in that electric means are provided to form a non-rotationally symmetrical lens element in the area of the focusing structure.

4,961,023
CATHODE RAY TUBE INCLUDING A HELICAL FOCUSING LENS

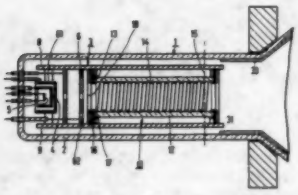
Gerardus A. H. M. Vrijssen, and Ronald Van Rijswijk, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 18, 1989, Ser. No. 408,985

Claims priority, application Netherlands, Sep. 21, 1988, 8802333

Int. Cl.[5] H01J *29/46, 29/56*

U.S. Cl. 313—456 **10 Claims**



1. A cathode ray tube having an envelope comprising a phosphor screen on one side and a neck portion on the other side, and an electron gun which is positioned in the neck portion and has a beam-shaping part and a focusing structure, said beam-shaping part comprising a cathode and at least one metal electrode, and said focusing structure comprising a hollow tube which is open at both ends and is made of an electrically insulating material with a layer of high-ohmic resistive material on the inner surface, characterized in that the components of the beam-shaping part of the electron gun, together with the hollow tube are secured via metal supporting elements to at least two axial mounting rods, the tube being fixedly connected at each of its end faces to a metal plate having a coaxial opening which is provided with a flange projecting into the hollow tube.

4,961,024
CIRCULAR FLUORESCENT LAMP WITH OVAL SECTION OF TUBE

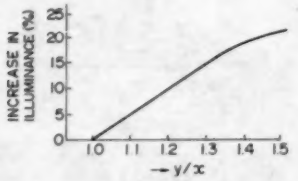
Churyo Kodama, Tokyo; Yasuo Hirasawa, Ome, and Yukio Ohno, Akishima, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 24, 1988, Ser. No. 211,246

Claims priority, application Japan, Jun. 26, 1987, 62-157615

Int. Cl.[5] H01J *61/30, 63/02*

U.S. Cl. 313—493 **4 Claims**



1. A circular fluorescent lamp, comprising:

a fluorescent tube of a generally circular shape having electrodes fixed in both ends thereof respectively and enclosing inert gas and mercury therein, and a cap mounted to bridge between said tube ends, said fluorescent tube having an oval sectional shape relative to a line perpendicular with respect to the tube axis, wherein the oval sectional shape has a rate of ovalness y/x representing the ratio between a larger tube diameter y and a smaller tube diameter x of the oval sectional shape that lies within the range of 1.10 to 1.30, and wherein said larger tube diameter y is in the range of 30 to 34 mm, said smaller tube diameter x is in the range of 25 to 29 mm, and said fluorescent tube has a thickness in the range of 0.7 to 1.0 mm.

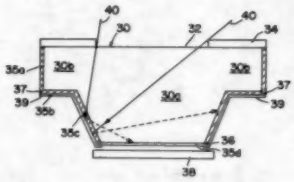
4,961,025
CATHODE FOR IMAGE INTENSIFIER TUBE HAVING REDUCED VEILING GLARE

Nils I. Thomas, Roanoke; Albert F. Tien, Salem, and Kenneth A. Brown, Buchanan, all of Va., assignors to ITT Corporation, New York, N.Y.

Filed Aug. 18, 1988, Ser. No. 233,501

Int. Cl.[5] C03B *32/00;* **H01J** *43/28*

U.S. Cl. 313—524 **11 Claims**



9. An image intensifier tube comprising:

a faceplate formed of optical material having a light receiving surface and a light transmitting surface on opposite sides of an optical axis thereof and a light absorbing area on an outer surface of said faceplate radially spaced in a direction normal to the optical axis, said light absorbing area containing reduced metal oxide which optically darkens the optical material extending from the outer surface into the optical material to a depth of sufficient to reduce stray light in the resulting faceplate, said depth being in the range of 0.020–0.030 inch for reducing stray light in the faceplate to less than 0.8% in the spectral region of 600nm–1000nm;

photoemissive means at said light transmitting surface for emitting electrons in response to light transmitted through said faceplate; and

a micro-channel plate positioned adjacent said photoemissive means for amplifying the electrons emitted from said photoemissive means.

4,961,026
PROXIMITY FOCUSED IMAGE INTENSIFIER HAVING A GLASS SPACER RING BETWEEN A PHOTOCATHODE AND A FLUORESCENT SCREEN DISK

Hans W. Funk, Hirschberg; Kurt Frank, Darmstadt, and Bernd Engel, Grosse-Gerau, all of Fed. Rep. of Germany, assignors to Proxitronic Funk GmbH & Co. KG, Bensheim, Fed. Rep. of Germany

Filed Feb. 3, 1989, Ser. No. 306,442

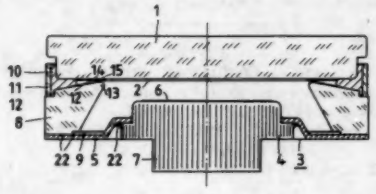
Claims priority, application Fed. Rep. of Germany, Feb. 13, 1988, 3804516

Int. Cl.[5] H01J *43/28*

U.S. Cl. 313—525 **28 Claims**

1. In an image intensifier comprising an evacuated vessel with a first disk which forms an input window and on whose inner surface a photocathode is disposed, and with a second disk which forms an output window and on whose inner surface of fluorescent screen is disposed, the spacing between the first and second disks being small in relation to the diameter of the image intensifier, the input and output windows being plane-parallel, and a spacer ring being disposed between the first and second disks whose inside diameter increases from the

area of the first disk in the direction of the second disk, the improvement wherein the face of the spacer ring directed



toward the first disk is provided with an electrically conductive layer.

4,961,027

DISCHARGE LAMP HAVING A STANDARDIZED BASE

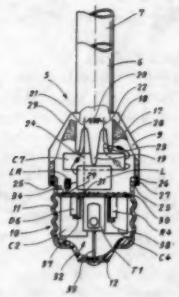
Daniel Müessli, Ulmiz, Switzerland, assignor to Skyline Holding AG, Ulimz, Switzerland

Filed Jun. 12, 1989, Ser. No. 364,456

Claims priority, application France, Jun. 13, 1988, 88 07981

Int. Cl.[5] H01J *7/44*

U.S. Cl. 315—58 **11 Claims**



1. An illumination lamp including at least one low pressure discharge tube, a standardized base intended to be screwed or otherwise introduced into a socket connected to an electrical distribution network, an electronic circuit transforming the low frequency of the distribution network into high frequency for energizing the tube and an intermediate element arranged between the tube and the base wherein the electronic circuit at least is entirely contained within the standardized base.

4,961,028

LIGHTING EQUIPMENT

Hiroaki Tanaka, Tokyo, Japan, assignor to Hayashi Tokei Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 10, 1988, Ser. No. 269,493

Int. Cl.[5] H01J *41/16*

U.S. Cl. 315—91 **5 Claims**

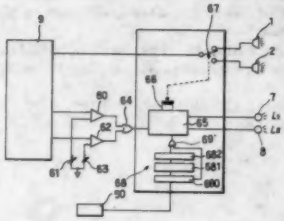
1. A lighting equipment having automatic lamp substitution comprising;

a plurality of light sources,

means for leading the light from the plurality of light sources to an appropriate portion,

switching means for selectively distributing power to at least one of the plurality of light sources in order to activate it, means for adjusting the volume of said power,

detecting and comparing means for distinguishing between failure of the activated light source and the minimum volume of the power to the activated light source so as to detect only failure of the activated light source; and



said switching means changes the power supply from the failed light source to at least another one of the plurality of light sources responding to a signal from said detecting means.

4,961,029

DISCHARGE LAMP LIGHTING DEVICE

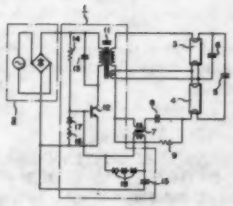
Keiichi Shimizu; Kenichi Inui, and Nanjou Aoike, all of Yokohama, Japan, assignors to Toshiba Electric Equipment Corporation, Tokyo, Japan

Filed Mar. 22, 1989, Ser. No. 327,134

Claims priority, application Japan, Mar. 31, 1988, 63-79962; May 17, 1988, 63-119941

Int. Cl.[5] H05B *41/24*

U.S. Cl. 315—219 **4 Claims**



1. A discharge lamp operating apparatus comprising:

inverter means for inverting a DC voltage to a high frequency voltage, said inverter means including at least one switching element which is controlled on-off stage in response to a high frequency feedback signal, said DC voltage inverted to said high frequency voltage by an on-off conversion of said switching element;

a discharge lamp, energized by the high frequency voltage from said inverter means;

a current transformer having a primary winding and a secondary winding, said primary winding, through which a lamp current flows, being provided in a circuit which energizes said discharge lamp by means of said inverter means, said feedback signal which controls a high frequency on-off conversion of said switching element of said inverter means being generated in said secondary winding;

direct current blocking means, connected in series with said primary winding of said current transformer, for generating a high frequency alternating output, as said feedback signal, based on said lamp current and blocking a direct current in said primary winding of said current transformer; and

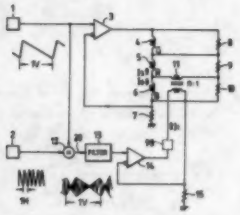
bypath means, connected in parallel with said direct current blocking means and said primary winding of said current transformer, for bypassing the direct current.

4,961,030

MISS CONVERGENCE COMPENSATING DEVICE FOR PROJECTION TYPE DISPLAY

Masanori Ogino; Takeo Yamada; Miyuki Ikeda, and Toshiyuki Kimoto, all of Yokohama, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed May 18, 1989, Ser. No. 353,787
Claims priority, application Japan, May 19, 1988, 63-120554; Jul. 13, 1988, 63-172773
Int. Cl.[5] H01J 29/70; H04N 9/31
U.S. Cl. 315—368 18 Claims



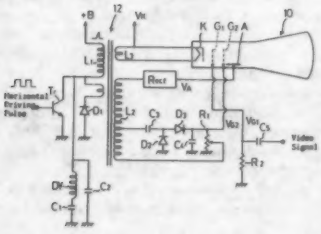
1. A miss convergence compensating apparatus for projection type display comprising a plurality of deflection coils for deflecting electron beams at a plurality of projection tubes emitting monochrome beams, deflection circuits to flow deflection currents to said deflection coils, a miss convergence compensating signal generating means which generates a miss convergence compensating signal and a transformer coupling means which receives an output signal from said generating means and flows a compensating current corresponding to said output signal to at least two deflection coils among said plurality of deflection coils, said transformer coupling means being coupled to allow currents of the same magnitude and opposite polarity to flow as the compensating currents at least into the two deflection coils.

4,961,031

FOCUS VOLTAGE REGULATION CIRCUIT FOR CATHODE RAY TUBES

Mitsuhisa Nakagawa, and Shogo Koseki, both of Ome, Japan, assignors to Nippon Chemi-Con Corporation, Tokyo, Japan

Filed Oct. 20, 1988, Ser. No. 260,049
Claims priority, application Japan, Nov. 30, 1987, 62-299823
Int. Cl.[5] H01J 29/58, 29/70
U.S. Cl. 315—382 6 Claims



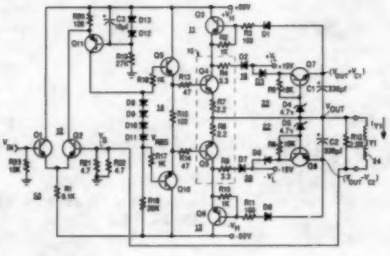
1. A focus voltage regulation circuit for cathode ray tubes, comprising means for rectifying a first voltage induced in a secondary winding of a flyback transformer to produce a direct current voltage and supplying said direct current voltage to the anode of a cathode ray tube; a tap provided on a part of said secondary winding for obtaining a second voltage from said secondary winding; a voltage-divided circuit comprising a variable resistor on its output side and receiving said second voltage obtained by said tap; said voltage-divided circuit generating a grid voltage to be applied to a grid of said cathode ray tube; and means superimposing a voltage regulated by said variable resistor onto a secondary winding.

4,961,032

DUAL POWER SOURCE OUTPUT AMPLIFIER

Enrique Rodriguez-Cavazos, Indianapolis, Ind., assignor to RCA Licensing Corporation, Princeton, N.J.

Filed Dec. 29, 1988, Ser. No. 291,831
Int. Cl.[5] H01J 29/70, 29/76
U.S. Cl. 315—397 22 Claims



1. A dual source amplifier and deflection coil circuit, comprising:

a deflection coil for a cathode ray tube;

a linear gain stage for generating an output voltage for driving the deflection coil, coupled to a first source of a first voltage level in a low voltage mode of operation;

a second source of a second voltage level of a higher magnitude than the first voltage level and of like polarity;

means for anticipating high level output voltage demand by monitoring the output voltage and generating a control signal related to the output voltage; and,

a voltage regulator responsive to the control signal and coupled to the second voltage source and the gain stage, for applying regulated high voltage to the gain stage during the high level output voltage demand, the regulated high voltage, when applied, varying in accordance with the output voltage and maintaining substantially linear operation of the gain stage.

4,961,033

CURRENT LIMITER FOR AN ELECTRICAL ACTUATOR

Fumiaki Hirota, Toyota, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Aichi, Japan

Filed Dec. 23, 1988, Ser. No. 288,889
Claims priority, application Japan, Dec. 25, 1987, 62-328714
Int. Cl.[5] H02P 7/00
U.S. Cl. 318—560 4 Claims

1. A current limiter for an electrical actuator comprising:

switching means for controlling a current supplied to the electrical actuator selectivity;

detecting means for detecting a level of current flowing through the electrical actuator; and

electronic controlling means for adjusting a duty ratio of the switching means in order to limit excessive current;

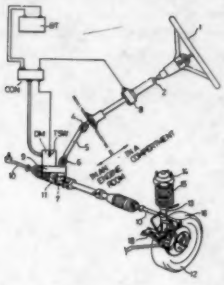
wherein the electronic controlling means further comprises

comparing means for comparing the current flowing through the electrical actuator with an upper threshold level and a lower threshold level;

decreasing means for decreasing the duty ratio of the switching means gradually if the detected current flowing through the electrical actuator exceeds the upper threshold level;

increasing means for increasing the duty ratio of the switch-

ing means gradually if the detected current flowing through the electrical actuator is below the lower threshold level; and



sustaining means for sustaining the duty ratio of the switching means if the current flowing through the electrical actuator is in a range between the upper threshold level and the lower threshold level.

4,961,034

NUMERICAL CONTROL DEVICE

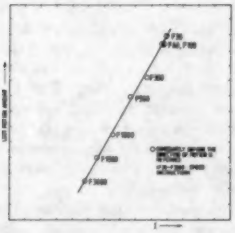
Yoshiaki Kakino, No. 256-5, Hanazono-cho, Iwakura, Sakyo-ku, Kyoto-shi, Kyoto; Yukitoshi Ihara, No. 583, Gojyobashihigashi 6-chome, Higashiyama-ku, Kyoto-shi, Kyoto; Mitsuo Yonetani, and Takeo Teshima, both of Aichi, all of Japan, assignors to Yoshiaki Kakino; Yukitoshi Ihara, both of Kyoto and Mitsubishi Denki Kabushiki Kaisha, Tokyo, all of, Japan

Filed Mar. 1, 1989, Ser. No. 317,390

Claims priority, application Japan, Mar. 1, 1988, 63-48118

Int. Cl.[5] G05B *19/00*

U.S. Cl. 318—600 **3 Claims**



1. A numerical control device for a machine tool having a mechanical movable part which is servo controlled by a servo motor in a servo mechanism, said device comprising:

motor current detecting means for detecting at a given time the drive current of said servo motor; and

lost motion correction data calculating means having a table/function which represents the drive current of said servo motor and the corresponding amount of lost motion correction,

said lost motion correction data calculating means calculating an amount of lost motion correction according to said table/function by using said motor current detected at a given time instant by said motor current detecting means, and utilizing the result of said calculation to correct the lost motion of said mechanical movable part.

4,961,035

ROTATIONAL ANGLE CONTROL OF SCREW TIGHTENING

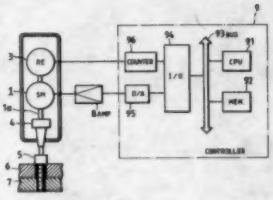
Hidetoshi Inaba, Yokohama; Hiroshi Hasegawa, Kanagawa, and Hiroshi Kato, Hatano, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 1, 1989, Ser. No. 304,649

Claims priority, application Japan, Feb. 4, 1988, 63-22787

Int. Cl.[5] G05B *19/28*

U.S. Cl. 318—600 **23 Claims**



1. A threaded coupling tightening device, comprising:

motor means having a shaft for operatively connecting to the coupling and for rotating said shaft with a velocity that decreases as shaft angular rotation increases during tightening of the threaded coupling;

measuring means responsive to the rotation of said shaft for providing plural shaft angle/time data with respect to a plurality of shaft angular positions; and

means for controlling said motor means to rotate said shaft from a starting point of tightening based solely on said angle/time data inputted from said measuring means, through a fixed rotation angle.

4,961,036

SYSTEM FOR CONTROLLING A WORKING SHAFT

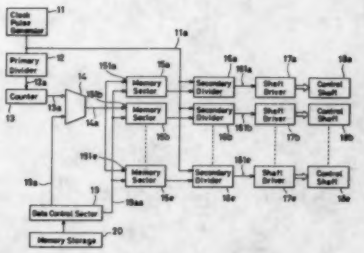
Haruhiko Arikawa, Kyoto, Japan, assignor to Mycom Kabushiki Kaisha, Kyoto, Japan

Filed Feb. 27, 1990, Ser. No. 485,690

Claims priority, application Japan, Apr. 11, 1989, 1-91194

Int. Cl.[5] H02P *5/40*

U.S. Cl. 318—603 **1 Claim**



1. A system for controlling a working shaft, which comprises:

a counter fed with clock signals to work as reference timing for actions in downstream;

a memory sector, having addresses accessible to output from said counter;

a divider connected to said memory sector and enabled to divide the clock signals with use of output from the memory sector;

a shaft driver to control the working shaft with a speed relative to output from the divider;

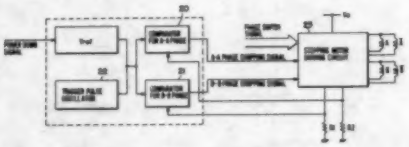
wherein said memory sector is priorly stored with data on speed operative to the shaft to be controlled.

4,961,037

STEPPING MOTOR CONTROL DEVICE

Akira Orii, and Hiroyuki Morita, both of Tokyo, Japan, assignors to Janome Sewing Machine Industry Co., Ltd., Tokyo, Japan

Filed Mar. 24, 1989, Ser. No. 328,467
Claims priority, application Japan, Mar. 25, 1988, 63-69291
Int. Cl.[5] H02P *8/00*
U.S. Cl. 318—696 **3 Claims**



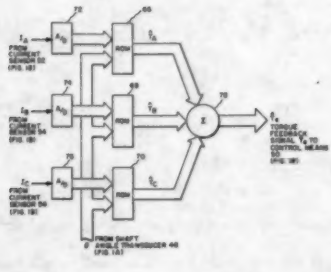
1. A stepping motor control device used in connection with a stepping motor driving circuit for controlling driving conditions of a stepping motor, comprising resistor means for detecting current values of windings of the stepping motor; an analog/digital converter for converting analog values into digital values, said analog values including first voltage values corresponding to the current values generated at said resistor means and a second voltage value supplied to the stepping motor driving circuit for driving the stepping motor; means for calculating a current value to be fed to the stepping motor driving circuit based on the digital values obtained at said analog/digital converter; first and second counters operated in response to the results obtained at said calculating means; an output control circuit adapted to be operated in response to outputs from said first and second counters to generate a pulse-width-modulation signal and an oscillator for supplying a clock signal to said first and second counters.

4,961,038

TORQUE ESTIMATOR FOR SWITCHED RELUCTANCE MACHINES

Stephen R. MacMinn, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Oct. 16, 1989, Ser. No. 421,885
Int. Cl.[5] H02P *8/00*
U.S. Cl. 318—696 **10 Claims**



1. Apparatus for estimating electromagnetic torque output of a switched reluctance machine having at least one phase, comprising:

rotor position sensor means for sensing the instantaneous position of said rotor and generating a rotor position signal representative thereof;

current sensor means for sensing the instantaneous phase current in each respective phase of said switched reluctance motor and generating a phase current signal representative thereof;

torque look-up table means responsive to said rotor position signal and each said phase current signal for generating a phase torque signal corresponding thereto; and

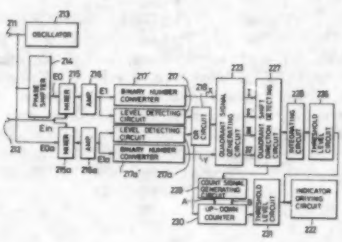
means for combining each said phase torque signals to produce a total torque signal.

4,961,039

MOVING OBJECT DETECTING DEVICE

Kazumasa Yamauchi; Hiromitsu Inoue, and Susumu Katayama, all of Kadoma, Japan, assignors to Matsushita Electric Works, Ltd., Osaka, Japan

Filed Mar. 28, 1988, Ser. No. 174,169
Claims priority, application Japan, Apr. 3, 1987, 62-83444; Oct. 27, 1987, 62-270770; Jan. 26, 1988, 63-15018; Jan. 26, 1988, 63-15019
Int. Cl.[5] G08B *13/18*
U.S. Cl. 340—554 **3 Claims**



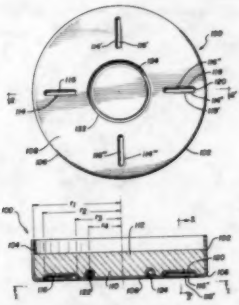
1. A moving object detecting device comprising:

means for oscillating at a predetermined frequency, a wave radiator for receiving an output of said oscillating means and radiating continuous energy waves to a supervisory zone, a wave receiver on which reflected waves of said continuous energy waves radiated by said wave radiator and back from an object in said supervisory zone are made incident, a converter connected to said wave receiver for converting a frequency deviation component of a received-wave signal from the receiver into a pair of intermediate signals which are mutually different in phase, means connected to said converter for detecting quadrants in which a received-wave signal vector is present in a vector plane the basic axes of which are said pair of intermediate signals, temporary storing means connected to said quadrant detecting means for temporarily storing detected quadrant signals therefrom, means receiving said quadrant signals to compare them with data signals previously stored in said temporary storing means for detecting a direction of a shift in quadrants, means receiving an output from said quadrant shift direction detecting means for operating to obtain addition and subtraction of quadrant shifts to determine the number of quadrant shifts which have taken place, and means receiving an output provided from said operating means when said output has exceeded a preset threshold level for indicating detected information on the moving object.

4,961,040
HIGH YIELD PAN-SHAPED GETTER DEVICE

Paolo della Porta; Daniele Martelli; Giuseppe Urso, and Stefano Trivellato, all of Milan, Italy, assignors to SAES Getters SpA, Milan, Italy

Filed Apr. 14, 1989, Ser. No. 338,160
Claims priority, application Italy, Apr. 20, 1988, 20261 A/88
Int. Cl.[5] H01J *29/94, 7/18*
U.S. Cl. 313—561 **16 Claims**

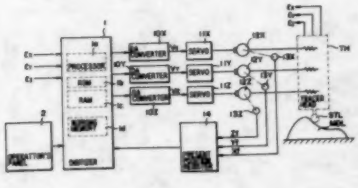


1. An evaporable getter device for mounting in an electron tube comprising a pan-shaped container having a vertical sidewall formed around the perimeter of a disc-shaped bottom wall and a pulverized getter metal vapour releasing material pressed into the space formed by said sidewall and said bottom wall and first heat transfer retarding means adapted to delay the transfer of heat in a circumferential direction through said getter metal vapour releasing material and second heat transfer retarding means adapted to delay the transfer of heat in a radial direction through the getter metal vapor releasing material when the getter device is heated by currents induced from an RF field created by a coil positioned outside the tube opposite the getter device in which said first heat transfer retarding means comprises a multiplicity of equally spaced radial grooves integrally formed in the disc shaped bottom wall at least partially penetrating into the space formed by said sidewall and said bottom wall.

4,961,041
METHOD OF CREATING NUMERICAL CONTROL DATA FOR ROUGH MACHINING

Masaki Seki, Tokyo; Koji Samukawa, and Hidenori Meguro, both of Yamanashi, all of Japan, assignors to Fanuc Ltd., Minamitsuru, Japan

PCT No. PCT/JP88/00651, § 371 Date Feb. 9, 1989, § 102(e) Date Feb. 9, 1989, PCT Pub. No. WO89/00303, PCT Pub. Date Jan. 12, 1989
PCT Filed Jun. 29, 1988, Ser. No. 314,054
Claims priority, application Japan, Jun. 30, 1987, 62-163534
Int. Cl.[5] G05B *19/33*
U.S. Cl. 318—578 **5 Claims**



1. A method of creating numerical control data for rough machining in which a workpiece is subjected to roughing-out by a tool of a predetermined radius, said method using point sequence paths selected from among a plurality of point sequence paths previously produced by digitizing a surface of the workpiece repeatedly at a predetermined interval in a predetermined direction, said method comprising the steps of:

(a) outputting a first cutting path for rough machining on the surface of the workpiece along an i-th point sequence path PLi;

(b) projecting each point sequence path onto a plane to produce projected point sequence paths;

(c) obtaining an i-th projected point sequence path PLi' representing said i-th point sequence path PLi projected onto the plane;

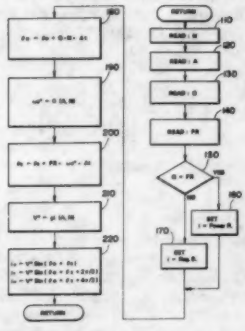
(d) obtaining in the plane a k-th projected point sequence path PLk' which among the projected point sequence paths spaced away from said i-th projected point sequence path PLi' by a distance greater than said predetermined radius of the tool is nearest said i-th projected point sequence path PLi'; and

(e) generating and outputting a second cutting path on the surface of the workpiece for rough machining by selecting a k-th point sequence path among the point sequence pathos, corresponding to said projected point sequence path PLk'.

4,961,042
DEVICE FOR CONTROLLING AC MOTOR

Takashi Imaseki, Yokosuka, Japan, assignor to Nissan Motor Company, Ltd., Japan

Continuation of Ser. No. 938,067, Dec. 4, 1986, abandoned. This application Feb. 21, 1989, Ser. No. 313,349
Claims priority, application Japan, Dec. 5, 1985, 60-272395
Int. Cl.[5] H02P *3/18*
U.S. Cl. 318—758 **10 Claims**



1. A device for controlling an AC motor operable in a power running mode and a regenerative braking mode, comprising:

position means for generating pulses in response to rotation of said AC motor;

detector means responsive to said pulses for detecting a direction of rotation of the AC motor and, responsive thereto, generating an actual direction indicator signal;

selector means for generating a desired direction indicator signal indicative of a desired direction of rotation of the AC motor; and

control means for comparing said actual direction indicator signal with said desired direction indicator signal and, in response to said comparison, controlling the AC motor such that the AC motor operates (1) in said power running mode when said actual direction indicator signal is equal to said desired direction indicator signal and (2) in said regenerative braking mode when said actual direction indicator signal is not equal to said desired direction indicator signal.

4,961,043

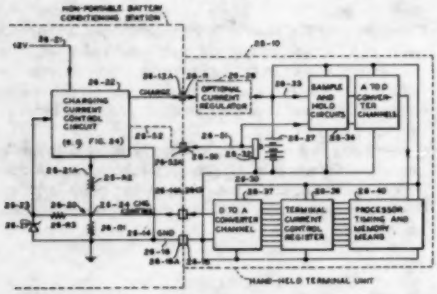
BATTERY CONDITIONING SYSTEM HAVING COMMUNICATION WITH BATTERY PARAMETER MEMORY MEANS IN CONJUNCTION WITH BATTERY CONDITIONING

Steven E. Koenck, Cedar Rapids, Iowa, assignor to Norand Corporation, Cedar Rapids, Iowa

Division of Ser. No. 168,352, Mar. 15, 1988. This application Oct. 16, 1989, Ser. No. 422,226

Int. Cl.[5] H02J 7/00

U.S. Cl. 320—21 **24 Claims**


NON-PORTABLE BATTERY CONDITIONING STATION
CHARGING CURRENT CONTROL CIRCUIT
OPTIONAL CURRENT REGULATOR
SAMPLE AND HOLD CIRCUITS
A TO D CONVERTER CHANNELS
D TO A CONVERTER CHANNEL
TERMINAL CURRENT CONTROL REGISTER
PROCESSOR TIMING AND MEMORY MEANS
HAND-HELD TERMINAL UNIT

20. The method of claim **17**, further comprising storage data in said data storage means in accordance with a measure of battery terminal voltage.

4,961,044

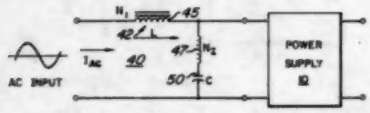
POWER FACTOR CORRECTION CIRCUIT FOR POWER SUPPLIES

Melvin Kravitz, 6 Seaside Dr., Port Jefferson, N.Y. 11777

Filed Sep. 1, 1989, Ser. No. 401,805

Int. Cl.[5] G05F 3/06

U.S. Cl. 323—205 **4 Claims**



1. A power factor correction circuit for an AC to low voltage DC power supply designed to be connected to a source of AC power, said circuit comprising

a linear transformer having primary and secondary windings, said primary winding being arranged and adapted to be connected electrically in series with and between said source and said power supply, said primary winding having an inductance value selected to reduce odd harmonics from the line current drawn by said power supply as a load on said source of AC power, and

a capacitor electrically connected in series with said secondary winding, the series connection of said capacitor and said secondary winding being arranged and adapted to be connected electrically in parallel with said power supply, between said primary winding and said power supply, said capacitor having a capacitance value selected to provide the reactive power demand of said power supply as a load on said source of AC power, and said secondary winding having a turns ratio relative to said primary winding selected to eliminate the loss of power supply operating line range caused by the voltage drop across said primary winding when said power factor correction circuit is electrically connected between said source of AC power and said power supply load,

whereby to provide voltage regulation by said power supply proportional to substantially undistorted line input current from said source of AC power, with improved power factor, while overcoming the AC voltage drop across said primary winding that would otherwise reduce the operating line range of said power supply.

4,961,045

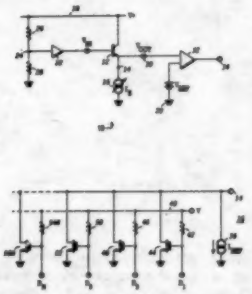
FLOATING OUTPUT DIGITAL TO ANALOG CONVERTER

Randall C. Gray, Tempe, Ariz., and Arthur Edwards, Hoffman Estates, Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Oct. 27, 1989, Ser. No. 427,552

Int. Cl.[5] G05F 1/56

U.S. Cl. 323—273 **7 Claims**



1. A circuit for providing an output voltage having a small voltage variation induced onto a larger direct current voltage component, comprising:

a first transistor having first, second and control electrodes, said control electrode being coupled to a terminal at which the direct current voltage component is supplied, said second electrode being coupled to a first power supply conductor; and

controlled current supply means coupled to said first electrode of said first transistor and being responsive to control signals applied thereto for varying the magnitude of current flowing through said first transistor independently of said direct current voltage component to produce the output voltage at said first electrode.

4,961,046

VOLTAGE-TO-CURRENT CONVERTER

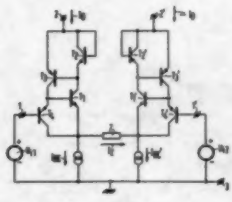
Willem De Jager, Enschede, Netherlands, assignor to U.S. Philips Corp., New York, N.Y.

Filed Aug. 11, 1989, Ser. No. 392,633

Claims priority, application Netherlands, Aug. 19, 1988, 8802058

Int. Cl.[5] G05F 3/20

U.S. Cl. 323—315 **6 Claims**



1. A voltage-to-current converter, comprising an input for receiving an input signal, an output for supplying an output

signal, a first transistor of a first conductivity type, having its emitter coupled to a reference-voltage point through an impedance and having its collector coupled to the output through the base-emitter junction of a diode-connected second transistor, the emitter-base junction of a third transistor of a second conductivity type being arranged in parallel with the base-emitter junction of the second transistor, the collector of said third transistor being coupled to the base of the first transistor and also being coupled to the input through the emitter-base junction of a fourth transistor of the second conductivity type which has its collector coupled to the emitter of the first transistor, characterized in that the second transistor is of the first conductivity type. .

4,961,047

ELECTRICAL POWER CONTROL APPARATUS AND METHODS

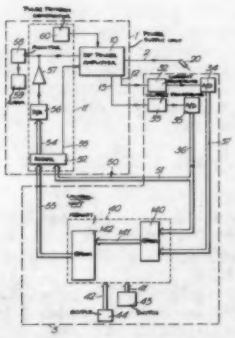
Timothy J. Carder, Brighton, England, assignor to Smiths Industries Public Limited Company, London, England

Filed Oct. 24, 1989, Ser. No. 427,214

Claims priority, application United Kingdom, Nov. 10, 1988, 8826316; Jul. 18, 1989, 8916360

Int. Cl.[5] A61B *17/39*; G05F *1/66*

U.S. Cl. 323—322 **11 Claims**



1. Electrical power control apparatus comprising: a power supply unit, said power supply unit being arranged to deliver an alternating power output signal; store means including a plurality of storage locations, each of said storage locations containing information for use in providing an input signal, means for supplying said input signal to said power supply unit such as to control the level of the power output signal in accordance therewith; means for deriving a first digital signal representative of the voltage and current of the output signal; means for deriving a second digital signal representative of a performance characteristic of the apparatus, wherein the first and second digital signals together define the location of one of said storage locations such that as the output voltage, current or performance characteristic changes a different one of said storage locations is addressed and said input signal is varied accordingly to control said output signal.

4,961,048

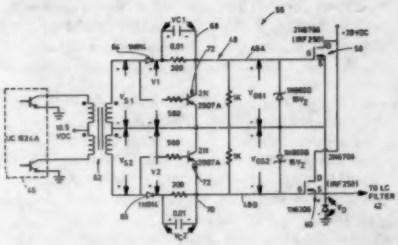
MOSFET SWITCHING ARRANGEMENT IN A POWER CONVERTER UNIT

George A. Banura, Ridgecrest, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 3, 1989, Ser. No. 389,245

Int. Cl.[5] H02M *3/158*

U.S. Cl. 323—351 **11 Claims**



1. A MOSFET switching arrangement in a switching DC/DC converter, comprising:

(a) a pair of MOSFETs connected in parallel between an input and an output of the converter;

(b) a drive circuit having first and second portions connected in parallel with one another and in series with said MOSFETs for driving said MOSFETs; and

(c) means for generating an AC signal, each of said respective first and second drive circuit portions including serially-arranged current flow control means and drive circuit switching means connected between said AC signal generating means and said MOSFETs for respectively permitting current flow in one direction only from said AC signal generating means to said MOSFETs and alternately driving of said MOSFETs in a coordinated fashion such that when one of said MOSFETs is turned on, closing a conductive path between the input and output of the converter, the other of said MOSFETs is turned off, opening the conductive path.

4,961,049

MAGNETICALLY-COUPLED APPARATUS FOR MEASURING ELECTRICAL CURRENT

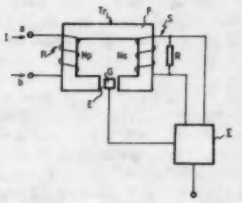
Luca Ghislanzoni, Noordwijk, Netherlands, assignor to Agence Spatiale Europeenne, Paris, France

Filed Dec. 7, 1988, Ser. No. 281,124

Claims priority, application France, Dec. 11, 1987, 87 17313

Int. Cl.[5] G01R *19/00*

U.S. Cl. 324—117 H **13 Claims**



1. Current measuring apparatus of the magnetically coupled type, the apparatus comprising a transformer provided with:

a magnetic circuit defined by a core of ferromagnetic material having a gap and a device placed in the gap for pro-

viding a first signal which is a function of the magnetic flux existing in the gap; and

a primary winding having the current to be measured flowing therethrough, and a substantially short circuited secondary winding, with each of the windings being disposed around said magnetic circuit and each including its own number of turns;

the apparatus further including:

separator means for separating the D.C. component and the low frequency A.C. components in the current to be measured from the high frequency A.C. components of the same current, wherein said separator means for separating the D.C. component and the low frequency A.C. components from the high frequency A.C. components is constituted by said secondary winding which is substantially short circuited;

means for generating a second signal proportional to said high frequency A.C. components, said means providing said second signal being constituted by a third winding disposed around said magnetic circuit, and said second signal being constituted by the voltage existing across the terminals of said third winding, wherein said third winding includes a very large number of turns;

said device placed in the gap providing said first signal, said first signal being proportional to the sum of said D.C. component and said low frequency A.C. components; and

summing means for summing said first and second signals, said summing means thus providing a third signal which is proportional to the current to be measured.

4,961,050

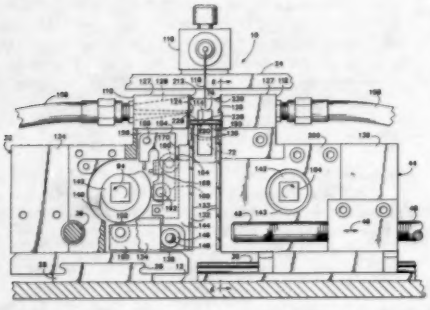
TEST FIXTURE FOR MICROSTRIP ASSEMBLIES

Warren K. Harwood, Vancouver, Wash.; Keith E. Jones, Beaverton, and Daniel DeLessert, Newberg, both of Oreg., assignors to Cascade Microtech, Inc., Beaverton, Oreg.

Filed Feb. 10, 1989, Ser. No. 309,698

Int. Cl.[5] G01R *1/02, 1/04*

U.S. Cl. 324—158 F **36 Claims**



22. A test fixture, for testing a microstrip assembly comprising a dielectric substrate with first and second main faces on opposite sides thereof and having first and second conductors on said first and second main faces, respectively, said fixture comprising:

(a) a base;

(b) respective first and second oppositely-facing launcher means for detachably electrically interconnecting said microstrip assembly with a pair of coaxial transmission lines, each of said launcher means having an inner conductor for detachably electrically connecting to said first conductor and an outer conductor for detachably electrically connecting to said second conductor;

(c) means connecting said first launcher means to said base for adjustably reciprocating said first launcher means along an axis extending toward the second one of said launcher means; and

(d) means connecting said second launcher means to said base for adjustably reciprocating said second launcher means in a direction transverse to said axis.

4,961,051

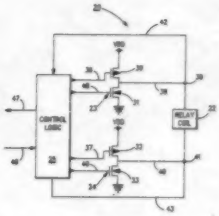
NON-ACTUATING RELAY DRIVER TESTER

Michael O. Tjebben, Raleigh, N.C., assignor to Alcatel NA, Inc., Hickory, N.C.

Continuation-in-part of Ser. No. 286,474, Dec. 19, 1988, abandoned. This application Nov. 14, 1989, Ser. No. 437,075

Int. Cl.[5] G01R *31/00*; H01H *47/00*

U.S. Cl. 324—415 **12 Claims**



1. A circuit for testing devices driving the coil of a relay without causing the relay to be switched, the circuit comprising:

a relay coil;

a first relay driver connected to one end of the relay coil;

a second relay driver connected to the opposed end of the relay coil; and

control means independently controllably connected to both the first relay driver and the second relay driver for transmitting separate signals thereto, independently connected to both sides of the relay coil for receiving independent signals therefrom as to the status thereof, and including logic means for sequentially initiating and transmitting a series of independent signals to the first relay driver and the second relay driver for causing each of said drivers to be actuated, while maintaining a constant voltage differential or a zero voltage differential across the relay coil, whereby each of the relay drivers is independently actuated to assure its operability while assuring that the relay coil is not activated.

4,961,052

PROBING PLATE FOR WAFER TESTING

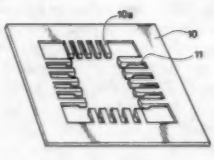
Tetsuo Tada; Ryoichi Takagi, and Masanobu Kohara, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 17, 1989, Ser. No. 380,427

Claims priority, application Japan, Jan. 7, 1989, 1-1623

Int. Cl.[5] G01R *31/02, 1/06*

U.S. Cl. 324—158 P **8 Claims**



1. A probing plate for wafer testing having a plurality of probes arranged so as to correspond to a plurality of bonding pads of semiconductor devices fabricated on a semiconductor wafer, comprising:

an electrically insulating base plate having raised portions

formed at predetermined positions in the major surface thereof;

contact conductors of a conductive film formed over the surfaces of said raised portions and serving as portions of said probes, respectively; and

wiring conductors formed integrally with said contact conductors over the major surface of said base plate in a predetermined pattern so as to extend respectively from said contact conductors,

wherein said raised portions are formed respectively at distal ends of contact fingers formed by removing portions of said base plate selectively by a photolithographic process so as to extend at predetermined intervals and correspond to said plurality of bonding pads.

4,961,053

CIRCUIT ARRANGEMENT FOR TESTING INTEGRATED CIRCUIT COMPONENTS

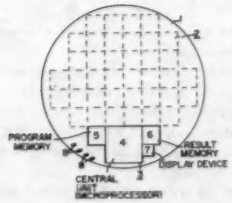
Heinz Krug, c/o Aksdemie Meru, Station 24, NL-6063 Vlodrop, Netherlands

Continuation of Ser. No. 888,460, Jul. 21, 1986, abandoned. This application Oct. 14, 1988, Ser. No. 258,095

Claims priority, application Fed. Rep. of Germany, Jul. 24, 1985, 3526485

Int. Cl.[5] G01R *31/28*

U.S. Cl. 324—158 R **29 Claims**



1. An arrangement for testing a plurality of circuit components forming an integrated circuit on a common base plate comprising:

testing circuit means common to each of the circuit components located in a region of the base plate independent of the circuit components for comparing output values of the circuit components with desired values for at least one test parameter, the testing circuit means being separable from the circuit components when the base plate is divided;

switching stages means on the base plate and controllable by the testing circuit means for connecting the testing circuit means to each of the circuit components; means for providing a common power supply to the testing circuit means and switching stages means;

the testing circuit means comprising an output circuit means for the output of test data, a central unit means for functionally testing the plurality of circuit components in accordance with a desired time sequence and for distinguishing between faulty and faultless circuit components with regard to the test parameter.

4,961,054

GRADIENT CURRENT SPEED-UP CIRCUIT FOR HIGH-SPEED NMR IMAGING SYSTEM

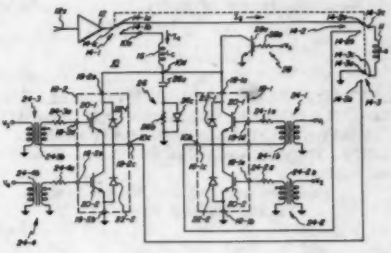
John N. Park, Rexford; Otward M. Mueller, Ballston Lake, and Peter B. Roemer, Schenectady, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Jul. 6, 1989, Ser. No. 376,074

Int. Cl.[5] G01R *33/20*

U.S. Cl. 324—322 **12 Claims**

1. A gradient current speed-up circuit for use in a higher-speed NMR imaging system having a gradient power amplifier and an associated gradient coil, comprises: an energy-storage element, having an inductance greater than the inductance of the associated gradient coil, and receiving a current I_c from said amplifier; a plurality of semiconductor switching devices receiving the I_c current output of the energy-storage element; means for connecting the associated gradient coil between



selected ones of the semiconductors devices; and means for turning the semiconductor devices on and off in selected patterns, to cause the energy-storage element current I_c to be suddenly applied to and removed from flow through the associated gradient coil.

4,961,055

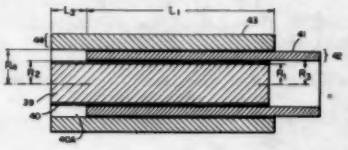
LINEAR CAPACITANCE DISPLACEMENT TRANSDUCER

Joseph Habib, Jackson, Mich.; Paul Nielsen, Marcus Hook, Pa., and Paul H. Nielsen, Wilmington, Del., assignors to Vickers, Incorporated, Maumee, Ohio

Filed Jan. 4, 1989, Ser. No. 293,204

Int. Cl.[5] G01R *27/26;* **G08C** *19/10*

U.S. Cl. 324—662 **51 Claims**



1. A coaxial variable capacitor for measuring linear displacement between a first and second member of an assembly comprising:

(a) a first cylindrical capacitor plate composed of electrically conductive material;

(b) a second cylindrical capacitor plate composed of electrically conductive material which slidably engages the first cylindrical capacitor plate further comprised of:

(1) a hole extending into but not through the second member;

(2) an extended rigid hollow transducer tube substantially the length of the hole comprised of:

(i) a longer section having a first diameter;

(ii) a second section having a second diameter larger than said first diameter of said first section;

(iii) a rounded shoulder joining the smaller diameter and larger diameter sections of the tube;

(3) a mounting flange; and

(4) means for attaching the mounting flange to the transducer tube

(c) a first dielectric material interposed between said first and second capacitor plates and covering the entire surface of one of said plates;

(d) means for attaching said first cylindrical plate to the first member of an assembly; and

(e) means for rigidly securing or attaching said second cylindrical capacitor plate to the second member of an assembly

wherein relative movement of the first and second members of the assembly causes corresponding relative movement of said first and second capacitor plates which results in a variable capacitance between the plates which is linearly related to the relative linear displacement of the first and second members of the assembly.

4,961,056

RELATIVISTIC KLYSTRON DRIVEN COMPACT HIGH GRADIENT ACCELERATOR AS AN INJECTOR TO AN X-RAY SYNCHROTRON RADIATION RING

David U. L. Yu, 1912 MacArthur St., Rancho Palos Verdes, Calif. 90732

Filed Sep. 13, 1989, Ser. No. 406,594
Int. Cl.[5] H05H *7/00, 13/04*
U.S. Cl. 328—235 9 Claims

1. Apparatus for generating high intensity X-rays comprising:

a relativistic klystron;

a high gradient linear accelerator driven by said relativistic klystron for producing high energy electrons; and

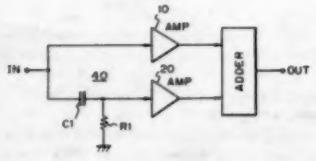
an electron storage ring responsive to the electrons injected therein by said accelerator for generating high intensity X-rays.

4,961,057

AUTOMATIC GAIN CONTROL AMPLIFIER FOR COMPENSATING CABLE LOSS

Sadao Ibukuro, Tokyo, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Dec. 23, 1988, Ser. No. 289,049
Claims priority, application Japan, Dec. 24, 1987, 62-333856
Int. Cl.[5] H03F *3/68*
U.S. Cl. 330—295 21 Claims



1. An automatic gain control amplifier for compensating a signal loss in a cable through which a signal having a frequency is passed, the signal loss being defined as a function of a square-root of the frequency, comprising:

a first amplifier having a first gain, receiving an input signal to be compensated and amplifying said input at said first gain;

a differential circuit having a constant differential coefficient defined by said frequency, receiving said input signal, and differentiating said input signal by said differential coefficient, and comprising:

a capacitor receiving the input signal; and

a resistor connected to said capacitor, said resistor and capacitor providing the constant differential coefficient;

a second amplifier, operatively connected to said resistor and capacitor of said differential circuit, having a second gain and amplifying said differential signal at said second gain; and

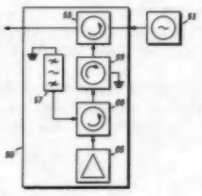
an adding circuit, operatively connected to said first and second amplifiers, adding said amplified signals therefrom to output an output signal in which said signal loss is compensated.

4,961,058

FEEDBACK STABILIZATION LOOP

Bernard E. Sigmon, Tempe, Ariz., assignor to Motorola, Inc., Schuamburg, Ill.

Filed May 22, 1989, Ser. No. 354,575
Int. Cl.[5] H03L *7/06;* H03B *9/01*
U.S. Cl. 331—9 12 Claims



1. A feedback stabilization loop for a signal generating source having an output;

a circulator having first and second ports and an output port, and constructed so that signals supplied to the second port are at least partially outputted from the first port;

a bandpass filter having an input, coupled to receive a portion of any output signals at the output port of said circulator, and an output;

an isolator having an input and an output said output of said isolator coupled to said second port of said circulator;

reference signal generating means including an input coupled to the output of said bandpass filter, and an output coupled to the input of said isolator; and

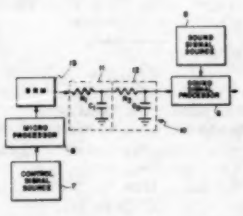
the first port of said circulator being coupled to the output of said signal generating source for presenting to said signal generating source an impedance locus which will substantially prevent changes in frequency in the output of said signal generating source.

4,961,059

COMBINED RFI REJECTION AND INTERGRATING TWO-SECTION FILTER

Mark R. Anderson, Indianapolis, Ind., assignor to RCA Licensing Corporation, Princeton, N.J.

Filed May 6, 1988, Ser. No. 190,843
Int. Cl.[5] H03H *7/06, 1/02*
U.S. Cl. 333—19 8 Claims



1. Apparatus comprising:

control means for providing a pulse signal encoded in binary

form with control information for a function to be controlled;

filter means for filtering said pulse signal to produce a DC control signal; and

processing means for performing said function in response to said DC control signal;

said filter means including first and second R-C sections configured as low pass filters coupled in cascade between said control means and said processing means; said first R-C section including a first resistor connected in a signal path between said control means and said processing means, and a first capacitor connected in shunt with said path; said second R-C section including a second resistor connected in series with said first resistor in said path, without an intervening impedance isolating element, and a second capacitors being of a non-electrolytic type; the values of said first resistor and said first capacitor being selected to establish a pole so that said first section both integrates said pulse signal and suppresses RFI components which might otherwise appear in said control signal; the values of said second resistor and said second capacitor being substantially equal to the respective values of said first resistor and said first capacitor to also establish a pole such that said second section also both integrates said pulse signal and suppresses RFI components which might otherwise appear in said control signal.

4,961,060

ELECTROMAGNETIC DELAY LINE COMPRISING SEVERAL CASCADED SECTIONS

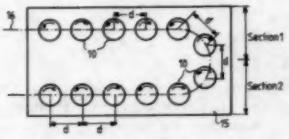
Daniel Grandjean, Varois; Jean-Michel Seurre, and Didier Zastko, both of Dijon, all of France, assignors to Compagnie Europeenne de Composants Electroniques LCC, Courbevoie, France

Filed Mar. 13, 1989, Ser. No. 322,594

Claims priority, application France, Mar. 15, 1988, 88 03319

Int. Cl.[5] H03H *7/18, 7/32*

U.S. Cl. 333—140 **14 Claims**



1. An electromagnetic lumped constant delay line formed by cascaded m-derived networks, said networks comprising capacitors and chokes, the chokes being placed along a line that is folded back so that substantial portions of said networks are parallel, said networks being connected together by two adjacent chokes separated by a distance which provides a desired coupling parameter m, between said adjacent chokes while non-adjacent chokes are separated by a distance which renders their coupling negligible.

4,961,061

PHASE-SHIFTING COMBINER FOR ELECTROMAGNETIC WAVES

Jean-Claude Cruchon, Bouffemont, and Gilbert Prost, Cergy Saint Christophe, both of France, assignors to Alcatel N.V., Amsterdam, Netherlands

Filed Apr. 4, 1989, Ser. No. 333,341

Claims priority, application France, Apr. 6, 1988, 88 04542

Int. Cl.[5] H01P *1/18, 5/00*

U.S. Cl. 333—156 **6 Claims**

1. A phase-shifting combiner for electromagnetic waves, the combiner comprising

at least one loop combiner cell further comprising

an inlet hybrid coupler,

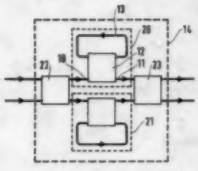
an outlet hybrid coupler,

a first phase-shifting cell disposed between the first outlet of the inlet hybrid coupler and the first inlet of the outlet hybrid coupler, and

a second phase-shifting cell disposed between the second outlet of the inlet coupler and the second inlet of the outlet coupler,

wherein each said phase-shifting cell further comprises

a loop hybrid coupler,



an inlet transmission line having a predetermined characteristic impedance and connected to the second inlet of the loop hybrid coupler,

an outlet transmission line also having said predetermined characteristic impedance and connected to the second outlet of the loop hybrid coupler,

a loop transmission line also having said predetermined characteristic impedance and connected between the first inlet and the first outlet of the loop hybrid coupler.

4,961,062

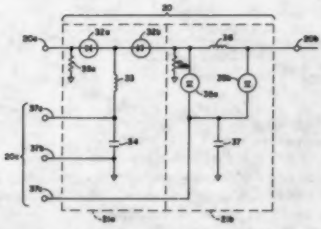
CONTINUALLY VARIABLE ANALOG PHASE SHIFTER

John P. Wendler, Brighton, Mass., assignor to Raytheon Company, Lexington, Mass.

Filed Jun. 12, 1989, Ser. No. 364,414

Int. Cl.[5] H03H *7/20;* **H01P** *1/185*

U.S. Cl. 333—164 **14 Claims**



1. An analog phase shifter comprising:

at least one low pass π network comprising a fixed inductance element and a pair of variable capacitance elements as shunt elements thereof; and

at least one high pass T network cascade connected to the low pass π network comprising a pair of variable capacitance elements connected in series and a fixed inductance element connected as the shunt element of the network.

4,961,063

FUSE TUBE FOR POWER AND CUTOUT FUSES

Jerle Lockaby, Rome, Ga., assignor to Specialized Hunting Equipment, Rome, Ga.

Filed Dec. 11, 1989, Ser. No. 448,708

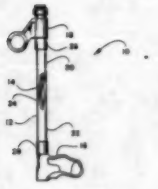
Int. Cl.[5] H01H *85/30, 71/10*

U.S. Cl. 337—241 **10 Claims**

1. A fuse tube, comprising: a hollow body having a first end portion, a second end portion, and a middle portion extending between said first and second end portions;

a first retroreflective indicator attached to said first end portion; and

a second retroreflective indicator attached to said second end portion, said body is movable between a first position at which said first indicator is above said second indicator and a second position at which said indicator is above said first indicator.



4,961,064

OIL LEAKAGE SENSOR

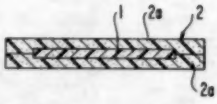
Sachio Hara, 8-2-813, Toyooka 1-Chome, Iruma-shi, Saitama, Japan

Filed Nov. 13, 1989, Ser. No. 435,643

Claims priority, application Japan, Dec. 8, 1988, 63-159010

Int. Cl.[5] H01C *1/02, 7/00, 8/00*

U.S. Cl. 338—231 **3 Claims**



1. An oil-leakage sensor comprising:

(a) a resistor formed of water-repellent porous resin having admixed fine electrically conductive carbon particles, said carbon particles being covered with an oil-penetrable water-repellent coating layer; and

(b) a covering material surrounding said resistor which comprises a water-repellent porous resin.

4,961,065

FAIL-SAFE RESISTOR

Eric B. Taylor, Willshire, Ohio, assignor to CTS Corporation, Elkhart, Ind.

Filed Mar. 27, 1989, Ser. No. 329,179

Int. Cl.[5] H01C *1/012*

U.S. Cl. 338—308 **5 Claims**

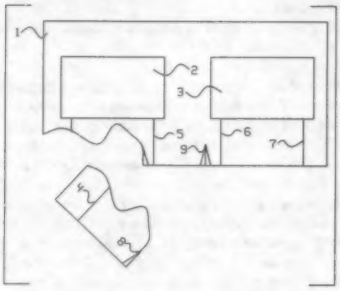
1. A fail-safe resistor comprising:

a relatively electrically non-conductive frangible substrate;

a means for conducting electricity, said conducting means being thermally coupled to said substrate;

a flaw within or upon said substrate, said flaw having one of multiple possible predetermined controlled dimension and multiple possible predetermined position combinations relative to said substrate;

whereby a predictable time duration for a particular power dissipation in said conducting means is required and sufficient to cause a break in said frangible substrate and to cause electrical discontinuity of said conducting means, said time duration dependent upon which one of said multiple controlled dimension and position combinations is further combined with said particular power dissipation.



4,961,066

FAULT CURRENT LIMITER

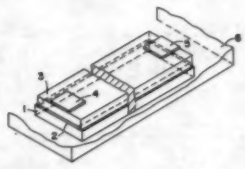
Nils-Johan Bergqjö, and Lars Liljestrand, both of Västerås, Sweden, assignors to Asea Brown Boveri AB, Västerås, Sweden

Filed Jun. 7, 1989, Ser. No. 362,667

Claims priority, application Sweden, Jun. 10, 1988, 8802172

Int. Cl.[5] H01L *43/00*

U.S. Cl. 338—32 S **7 Claims**



1. A fault current limiter comprising a first and a second resistor, the first resistor consisting of a material which may become superconducting, the second resistor consisting of a normally conducting material, an insulator for mechanical support of the resistors, and a cryotank, wherein the first resistor is arranged as a thin layer applied on the insulator and which is dimensioned such that the current limit at which the current limiter is to start operating corresponds to such a current density that the critical current density of the material is achieved, the second resistor is arranged as a layer applied on the first resistor, the second resistor is dimensioned such that its resistance reduces a possible over-current to an acceptable value, the second resistor is provided with current connection means, and wherein the insulator and the resistor are placed in the cryotank.

4,961,067

PATTERN DRIVEN INTERRUPT IN A DIGITAL DATA PROCESSOR

Minoru Suzuki, Tokyo, Japan, assignor to Motorola, Inc., Schaumburg, Ill.

Filed Jul. 28, 1986, Ser. No. 889,998

Int. Cl.[5] G06F *7/02*

U.S. Cl. 340—146.2 **21 Claims**

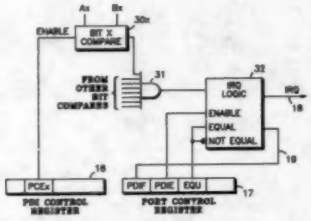
1. In a digital data processor of the type having a plurality of data inputs and data storage means, an apparatus for generating interrupt requests comprising:

a plurality of bit comparators each having an input coupled

to a respective one of said data inputs, an input coupled to said data storage means and an output, said output of each said bit comparator indicating a match when said inputs thereto are in identical logic states;

match select means for selecting one of a match condition and a mis-match condition; and

logic means coupled to said match select means and having inputs coupled to said outputs of said bit comparators for



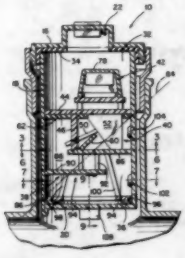
generating an interrupt request in response to said bit comparator outputs and said match select means, said logic means generating an interrupt request in response to a first condition of said bit comparator outputs if said match select means selects a match condition and generating an interrupt request in response to a second condition of said bit comparator outputs if said match select means selects a mis-match condition.

4,961,068

DOMESTIC SEWER ALARM

Curtis C. Hendricksen, 54 Van Buren Rd., Limestone, Me. 04750

Filed Jan. 11, 1989, Ser. No. 295,532
Int. Cl.[5] G08B *21/00*
U.S. Cl. 340—616 **23 Claims**



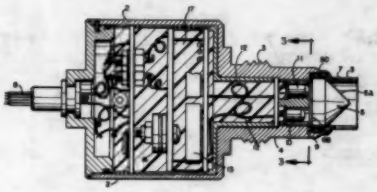
1. In an alarm assembly adapted to be installed in a clean-out opening of a sewer conduit having a clean-out access cap, a housing extending therefrom into which fluent back-up material rises from the sewer conduit, sensor means for detecting the fluent material above a predetermined back-up level within housing, indicator means triggered into operation in response to said detection of the fluent material by the sensor means and baffle means within the housing for protectively isolating the sensor means from impact by the fluent back-up material during inflow thereof into the housing, said housing enclosing a chamber extending axially from the access cap, closure means connected to the housing for sealing the chamber in axially spaced relation to the access cap and spacer means in abutment with the closure means for supporting the sensor means and the baffle means within the chamber in spaced relation to the closure means, said housing having inlet means for receiving said inflow of the fluent back-up material into the housing and outlet means for draining the fluent back-up material from the housing in response to receding thereof below said predetermined level.

4,961,069

DUAL OPTICAL LEVEL MONITOR

Edward Tsaprazis, Havertown, Pa., assignor to Aeroquip Corporation, Jackson, Mich.

Filed Dec. 7, 1988, Ser. No. 280,840
Int. Cl.[5] G08B *21/00*
U.S. Cl. 340—619 **27 Claims**



1. A sensor for determining the presence or absence of fluid which comprises:

a. a conical prism having a flat base wherein part of the prism's exterior conical surface extends into the space where the presence or absence of fluid is to be sensed;

b. a plurality of light sources adapted to direct light into the flat base of the prism towards the conical surface of the prism; and

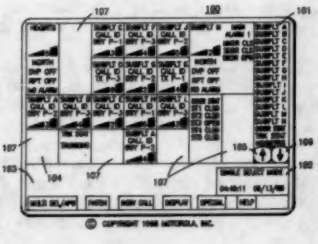
c. a plurality of photodetectors adapted to intercept light emerging from the flat base of the prism such that each photodetector is paired with a different light source by being positioned to receive light when the light from said source is twice totally internally reflected within the prism wherein each photodetector generates a signal when light from the light source with which it is paired strikes the photodetector.

4,961,070

RADIO CONSOLE WITH CRT DISPLAY

John W. Maher, Woodstock; Keith I. Mulford, Arlington Heights, and James C. Tykal, Streamwood, all of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jun. 2, 1988, Ser. No. 202,652
Int. Cl.[5] G09G *5/14*
U.S. Cl. 340—721 **12 Claims**
MICROFICHE APPENDIX INCLUDED
(161 Microfiche, 2 Pages)



1. A method of displaying, on a display, information selected from a plurality of information groups, wherein at least some of said information groups have a preselected display window configuration associated therewith, comprising the steps of:

(A) selecting, by an operator, one of said plurality of information groups to form a selected information group;

(B) automatically identifying, when available, at least one location on said display that can then accommodate said preselected display window configuration associated with said selected information group without allowing said preselected display window configuration to occlude any other information group then currently displayed on said display to form identified locations;

(C) automatically displaying said identified locations on said display;

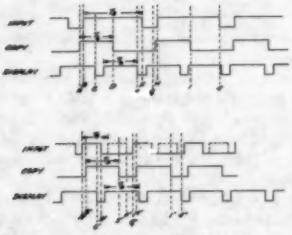
(D) selecting, by the operator, one of said identified locations to receive the selected information group.

4,961,071

APPARATUS FOR RECEIPT AND DISPLAY OF RASTER SCAN IMAGERY SIGNALS IN RELOCATABLE WINDOWS ON A VIDEO MONITOR

John R. Krooss, 750 Linden Ave., Los Altos, Calif. 94022

Filed Sep. 23, 1988, Ser. No. 249,646
Int. Cl.[5] G09G 1/16
U.S. Cl. 340—721 33 Claims



1. Apparatus for display of raster scan imagery signals in relocatable windows on a raster scan video display monitor on which the displayed imagery is periodically refreshed at the display refresh rate, said apparatus comprising:

means for providing digital raster scan imagery window input data defining sequential frames of images to be displayed in said window on said monitor, the window input data frame rate being asynchronous with respect to the monitor display refresh rate;

a processor comprising means for providing window definition signals determining the size and location of said window in relation to a monitor display frame;

apparatus responsive to said window definition signals for buffering the input window data to synchronize said data with the display refresh rate and thereby avoid discernible display anomalies, comprising:

a display memory buffer comprising means for storing image frame data representing the raster imagery data defining a complete image frame on said display monitor;

means for reading said image frame data in said display memory buffer to control said display raster, said reading operation occurring at the vertical rate establishing a "display active" time interval of said monitor and being repeated at the display refresh rate;

a window update buffer memory comprising means for storing a frame of the window input digital data;

means for loading said window input data comprising a frame of said window data into said update buffer memory; and

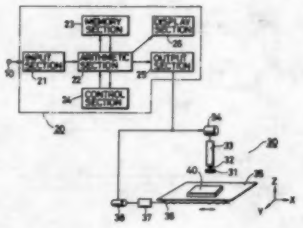
means for copying the contents of the update buffer memory into said display buffer at locations corresponding to the window location determined by said window definition signals, said copying operation of one frame being completed within a "copy active" time interval which is no longer than the "display active" time interval of said display monitor.

4,961,072

GRAPHICS DISPLAY METHOD FOR NUMERICAL CONTROL APPARATUS

Katsuhide Sekikawa, Aichi, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 1, 1984, Ser. No. 585,096
Claims priority, application Japan, Mar. 1, 1983, 58-33452
Int. Cl.[5] G09G 1/00
U.S. Cl. 340—731 10 Claims



1. A display method for a graphics display device of a numerical control apparatus for displaying graphic data relating to a machining apparatus and a workpiece, comprising:

operating an input section of said numerical control apparatus to input data relating to said machining apparatus, data relating to an initial configuration of said workpiece and data relating to a final configuration of said workpiece;

performing calculations on said data thus inputted to obtain configuration data;

displaying said configuration data on said graphics display device in the form of an image of a figure;

selecting a number N of regions of said figure which are desired to be subsequently displayed on said graphics display device;

inputting said number N as a display division selection number;

dividing the display area of said graphics display device into N portions;

inputting viewing points and scale factors for said selected regions, said viewing points being points geometrically predetermined from boundaries of said regions;

scaling and clipping the images of said regions in accordance with respective ones of said viewing points and scale factors;

storing said images thus scaled and clipped in a memory section; and

simultaneously displaying said images stored in said memory section on said graphics display device with one of said images being displayed within each one of said N portions.

4,961,073

BATTERY SAVING APPARATUS AND METHOD PROVIDING OPTIMUM SYNCHRONIZATION CODEWORD DETECTION

George Drapac; Stephen H. Woltz, both of Boca Raton, and Mark L. Oliboni, Boynton Beach, all of Fla., assignors to Motorola, Inc., Schaumburg, Del.

Filed Feb. 27, 1989, Ser. No. 315,957
Int. Cl.[5] H04B 7/00
U.S. Cl. 340—825.44 34 Claims

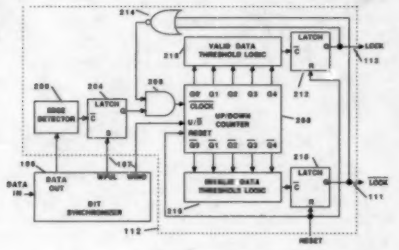
1. A battery saving method for supplying power to a selective call communication receiver for enabling the detection of a synchronization codeword in data received in a predetermined signaling format having a predetermined message batch length, said method comprising the steps of:

(a) supplying power to the receiver for a first portion of a first predetermined time interval, the first predetermined time interval having a time duration equal to at least the message batch length plus one codeword, for enabling the

detection of valid data in the predetermined signaling format

(b) maintaining the supply of power to the receiver for the remainder of the first predetermined time interval in response to detecting valid data in the first portion of the first predetermined time interval;

(c) correlating the received data during the first predetermined time interval for the detection of the synchronization codeword;



(d) re-enabling the detection of valid data within a second portion of the first predetermined time interval, in response to the synchronization codeword not being detected prior to the second portion; and

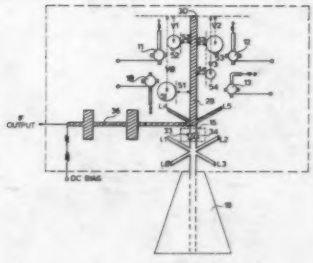
(e) maintaining the supply of power to the receiver for a second predetermined time interval, in response to the subsequent detection of valid data in the second portion of the first predetermined time interval.

4,961,074

MULTIBAND RADAR DETECTOR

Glen Martinson, Oakville, Canada, assignor to B.E.L-Tronics Limited, Mississauga, Canada

Filed Sep. 12, 1988, Ser. No. 242,540
Claims priority, application Canada, Dec. 23, 1987, 555194
Int. Cl.[5] G01S *7/285*; H04B *1/28*
U.S. Cl. 342—20 **10 Claims**



1. A multiband radar detector device comprising:

a broad band antenna;

at least one dielectric resonator local oscillator having an output at a first predetermined frequency;

a mixer having a radar signal input port, a local oscillator input port, and an intermediate frequency signal output port;

means to feed a signal from the antenna to the radar signal input port;

means to feed a signal from said at least one dielectric resonator local oscillator to the local oscillator signal input port of the mixer;

and means to feed a resulting intermediate frequency signal from said intermediate frequency signal output port of said mixer to signal processing circuitry for actuating an alarm in response to detected radar;

said multiband radar detector being adapted to respond to first and second radar frequency signals wherein the difference of a first radar frequency and the frequency of the dielectric resonator local oscillator is the intermediate frequency, or the difference of the second radar frequency and twice the frequency of the dielectric resonator local oscillator, is the intermediate frequency;

wherein said mixer comprises an anti-parallel pair of diodes, and bias supply means are provided to supply a direct current bias thereto so as to turn on either one of said pair of diodes depending on the sense of the bias supply thereto;

whereby the diode reflection co-efficient fundamental frequency may be the frequency of the dielectric resonator local oscillator or twice the frequency of the dielectric resonator local oscillator, depending on the presence or absence of said bias;

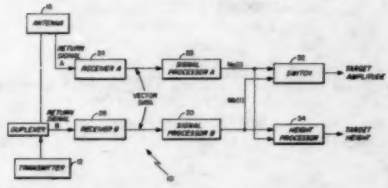
so that said resulting intermediate frequency signal is always a product of the fundamental frequency of the mixer diode reflection co-efficient for each of said first and second radar frequencies.

4,961,075

TWO AND ONE-HALF DIMENSIONAL RADAR SYSTEM

Harold R. Ward, Bedford, Mass., assignor to Raytheon Company, Lexington, Mass.

Filed Sep. 11, 1989, Ser. No. 405,789
Int. Cl.[5] G01S *3/46*
U.S. Cl. 342—140 **13 Claims**



1. A radar system for determining azimuth, range and height of a target over a predetermined range of elevation angles comprising:

means for transmitting a radar signal including a dual beam antenna having a high beam pattern and a low beam pattern;

first means coupled to said transmitting means for converting a return signal of said target from said high beam pattern to an amplitude sample $M_A(i)$, said first converting means comprises a first receiver means for producing vector data from said high beam return signal and a first processor means coupled to said first receiver means for determining said amplitude sample $M_A(i)$;

second means coupled to said transmitting means for converting a return signal of said target from said low beam pattern to an amplitude sample $M_B(i)$, said second converting means comprises a second receiver means for producing vector data from said low beam return signal and a second processor means coupled to said second receiver means for determining said amplitude sample $M_B(i)$; and

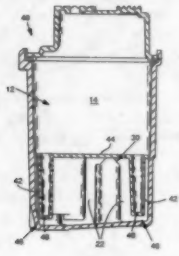
means coupled to said amplitude sample outputs $M_A(i)$ and $M_B(i)$ of said first converting means and said second converting means for processing said outputs to determine said height of said target.

4,961,076

RELIABILITY IMPROVEMENT FOR INK JET PENS

Bruce Cowger, Corvallis, Oreg., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Continuation-in-part of Ser. No. 286,567, Dec. 16, 1988, Continuation-in-part of Ser. No. 115,013, Oct. 28, 1987. This application Dec. 30, 1988, Ser. No. 292,585
Int. Cl.[5] G01D *15/18*
U.S. Cl. 346—1.1 4 Claims



3. A method of operating an ink jet pen that includes an ink reservoir, a catchbasin and an orifice coupling the reservoir and catchbasin, comprising the steps:

flowing ink from the reservoir to the catchbasin through the orifice when air in the reservoir expands; and

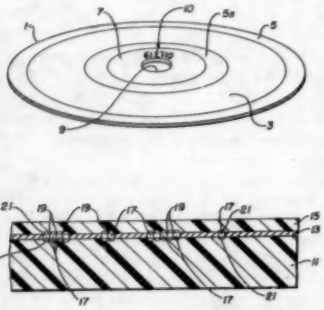
flowing substantially all of the ink from the catchbasin back to the reservoir when air in the reservoir contracts regardless of the orientation of the pen.

4,961,077

METHOD FOR AFFIXING INFORMATION ON READ-ONLY OPTICAL DISCS

Denney L. Wilson, Gastonia; Geoffrey A. Rhine, Shelby, and Thomas L. Elmquist, Gastonia, all of N.C., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Continuation of Ser. No. 157,832, Feb. 19, 1988, abandoned. This application Jul. 14, 1989, Ser. No. 380,676
Int. Cl.[5] G01D *9/00*
U.S. Cl. 346—1.1 6 Claims



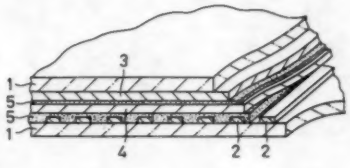
1. A method for affixing an internal pattern of visible information which is readable by the naked human eye upon the non-information areas of a read-only optical disc where the disc structure is comprised of (a) a continuous substrate layer, (b) a substantially continuous layer of reflective metal, and (c) an overlying continuous polymeric protective layer, at least one of (a) and (c) being substantially light-transmissive, which comprises passing a patterned sequence of pulsed laser light through a transparent layer at a power level sufficient to form a series of holes in the underlying reflective metal layer corresponding to the information pattern without disrupting the surface continuity of either of layers (a) and (c).

4,961,078

THERMALLY RECORDING HEAD USING INTEGRATED MICA AS THE SPACER LAYER

Yukihisa Takeuchi, and Toshikazu Hirota, both of Nagoya, Japan, assignors to NGK Insulators, Ltd., Japan

Filed May 18, 1989, Ser. No. 353,762
Claims priority, application Japan, May 20, 1988, 63-124496
Int. Cl.[5] G01D *15/10*
U.S. Cl. 346—76 PH 10 Claims



1. A recording head having a plurality of recording electrodes and at least one return circuit electrode, comprising:

an insulating layer consisting of an integrated mica disposed between an array of said plurality of recording electrodes and said at least one return circuit electrode, so as to form a multi-layer structure which includes said recording electrodes, said at least one return circuit electrode and said insulating layer; and

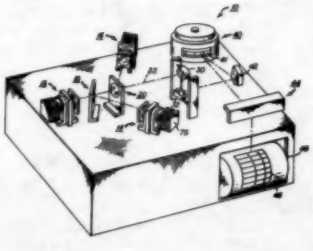
said recording electrodes and said at least one return circuit electrode being formed of an electrically conductive material which has a higher degree of wear resistance than that of said integrated mica.

4,961,079

LASER PRINTER HAVING ATHERMALIZED OPTICAL HEADS

James C. Owens, Pittsford; Roger E. Baldwin, Hilton, both of N.Y., and Chris P. Brophy, Tucson, Ariz., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 3, 1989, Ser. No. 293,024
Int. Cl.[5] G01D *15/14*
U.S. Cl. 346—108 11 Claims



1. A laser printer comprising:

a plurality of athermalized optical heads, each of said optical heads including a diode laser and a collimator lens, each of said heads including means for maintaining a constant distance between said diode laser and said lens over a predetermined range of ambient temperatures, each of said diode lasers being adapted to emit a beam of light at a wavelight different from the other lasers;

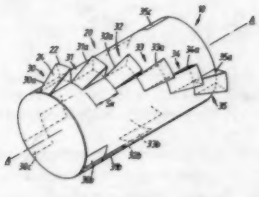
means for modulating the light beam from each of said lasers in accordance with an information signal;
means for combining said beams of light to form a combined beam of light;
means for shaping said combined beam;
means for scanning said combined beam onto a false sensitized receiving medium;
means for effecting relative movement between said receiving medium and said scanning means in a cross-scan direction; and
means for controlling said modulating means, said scanning means, and said means for effecting relative movement in timed relation to each other.

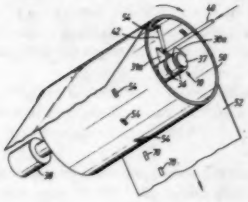
4,961,080

LASER MARKER WITH MASK SCANNING

Andrew R. Henderson, Milton, and Robert Jones, Cambridge, both of England, assignors to The Wiggins Teape Group Limited, Basingstoke, England

Filed Feb. 16, 1989, Ser. No. 310,875
Claims priority, application United Kingdom, Feb. 16, 1988, 8803560
Int. Cl.[5] G01D *15/14*; G02B *26/08*
U.S. Cl. 346—108 **41 Claims**





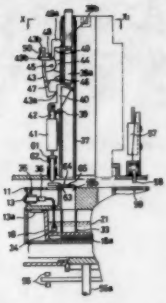
1. Apparatus for marking a moving sheet of material with light energy, comprising:
a mask having a light transmissive area of predetermined configuration defining a mark to be made on a moving sheet;
means mounting said mask for rotation about a predetermined axis to move said mask in a circular path;
a mirror;
means mounting said mirror for rotation about a predetermined axis to move in a circular path which includes a reflection location at which the mirror intersects a predetermined input light beam axis along which an input light beam is directable;
the motion of said mirror through said reflection location providing a beam reflection path that is angularly scanned in space;
said angularly scanned reflection path intercepting said circular path of said mask at a marking location; and
means controlling the respective rotations of said mask and mirror to cause said mask to move through, and said reflection path to intercept, said marking location simultaneously but at different speeds so that said reflection path scans said mask.

4,961,081

INK FEEDING MECHANISM FOR INK JET PRINTERS

Norio Shiga, Hachioji, Japan, assignor to Juki Corporation, Tokyo, Japan

Filed Jul. 1, 1988, Ser. No. 214,333
Claims priority, application Japan, Jul. 8, 1987, 62-105075[U]; Jul. 31, 1987, 62-118550[U]
Int. Cl.[5] G01D *15/16*; B41J *2/15*
U.S. Cl. 346—140 R **8 Claims**



1. In an ink jet printer having an ink holder with solid ink pellets vertically stored therein, an ink feeding mechanism, comprising:
means for stopping the bottom-stored pellet in the ink holder, said stopping means being retractable to release the bottom-stored pellet;
pressing means directly responsive to movement of said stopping means for pressing the pellet stored second from the bottom in the ink holder when said stopping means is retracted;
a presser lever which transmits the movement of said stopping means to said pressing means;
an actuator which acts to engage and retract said stopping means;
encoding means provided in association with a print head of said printer to determine the position of an ink container;
means responsive to said encoding means for positioning said ink container under the ink holder; and
means for temporarily locking the ink container in position under said ink holder.

4,961,082

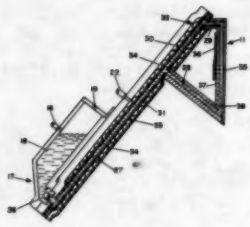
DEAERATION OF INK IN AN INK JET SYSTEM

Paul A. Hoisington; Nathan P. Hine, both of Norwich, and Charles W. Spehrley, Jr., Hartford, all of Vt., assignors to Spectra, Inc., Hanover, N.H.

Continuation of Ser. No. 43,372, Apr. 28, 1987, Pat. No. 4,788,556. This application Nov. 15, 1988, Ser. No. 272,004
Int. Cl.[5] G01D *15/16*; B41J *2/01*; B01D *19/00*
U.S. Cl. 346—140 R **7 Claims**

1. A device for removing dissolved gas from ink in an ink jet system comprising gas-permeable, ink-impermeable membrane material in sheet form, support means for supporting the sheet-form membrane material in a substantially planar disposition, means for applying ink containing dissolved gas to one side of

the sheet-form membrane material, and means for applying a reduced gas pressure to the other side of the sheet-form membrane material to cause gas dissolved in ink to be extracted from the ink through the sheet-form membrane material.



4,961,083

ELECTRONIC FLASH DEVICE FOR A CAMERA AND ACCESSORY SHOE FOR MOUNTING AN ELECTRONIC FLASH DEVICE ON A CAMERA

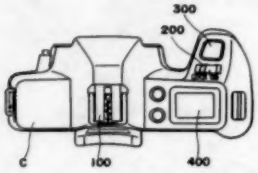
Masayuki Nakasa; Norio Ishikawa, and Hiroshi Hosomizu, all of Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed May 11, 1989, Ser. No. 350,401

Claims priority, application Japan, May 16, 1988, 63-118623

Int. Cl.[5] G03B *17/00*

U.S. Cl. 354—145.1 **20 Claims**



1. An accessory shoe for mounting an electronic flash device on a camera, said accessory shoe being located on a top portion of the camera and including a plurality of terminals for circuitry of the camera arrayed along a direction in which the electronic flash device is inserted into said accessory shoe, said plurality of terminals including at least a ground terminal and a terminal leading to an X contact of the camera for outputting a signal indicative of a condition of the X contact, said X contact terminal being positioned closer to an insertion opening of the accessory shoe than any other terminal of said plurality of terminals, including said ground terminal, and said X contact terminal being connectable to a terminal on the flash device for inputting said signal when the flash device is mounted on the camera.

4,961,084

CAMERA WITH CHANGEABLE FOCAL LENGTH

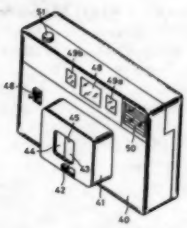
Hiroshi Komatsuzaki; Kazuo Kamata, both of Tokyo; Akio Ohmiya; Syunji Nishimura, both of Saitama; Yoshihito Umeda, Yamanashi; Noriya Mochizuki, Yamanashi, and Eiji Furuya, Yamanashi, all of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa and Nihon Seimitsu Kogyo Kabushiki Kaisha, Yamanashi, both of, Japan

Division of Ser. No. 291,450, Dec. 27, 1988. This application Sep. 6, 1989, Ser. No. 403,580

Claims priority, application Japan, Dec. 25, 1987, 62-328806; Dec. 26, 1987, 62-198153; Jan. 12, 1988, 63-4445

Int. Cl.[5] G03B *17/38*

U.S. Cl. 354—268 **5 Claims**



1. A focal length changeable camera having a taking lens system changeable between at least two different focal lengths, namely, relatively long and relatively short, said camera comprising:

shutter release means operable to unlock a shutter actuating member for causing a shutter to operate;

focal length changing means for changing said taking lens system between said at least two different focal lengths;

an interlock member movable between a first position preventing said focal length changing means from operating and a second position causing said focal length changing means to operate;

first restraining means provided on said interlock member for restraining said interlock member from moving to said second position when said shutter release means is operated; and

second restraining means provided on said interlock member for restraining said shutter release means from being operated when said interlock member is in said second position.

4,961,085

LENS FITTED FILM PACKAGE

Michio Cho; Ko Aosaki, and Tokuji Sato, all of Tokyo, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jul. 17, 1989, Ser. No. 380,527

Claims priority, application Japan, Jul. 15, 1988, 63-93787[U]; Jul. 18, 1988, 63-94711[U]; Jul. 18, 1988, 63-94712[U]; Aug. 5, 1988, 63-103930[U]

Int. Cl.[5] G03B *11/00*

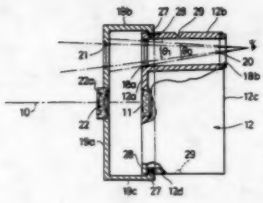
U.S. Cl. 354—295 **17 Claims**

1. A lens-fitted film package comprising:

a light-tight case having at least a taking lens attached to a front wall and a roll of film contained therein; and

a lens holder comprising a lens board holding a conversion lens and positioning strut means fit-table onto said light-tight case for positioning said lens board at such a distance from said front wall of said light-tight case that said con-

version lens is positioned so as to change the effective focal length of said taking lens, said positioning strut



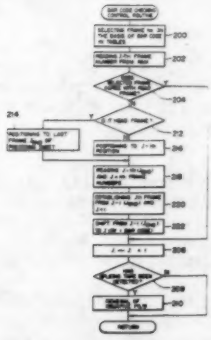
means being formed integrally with and foldable relative to said lens board.

4,961,086

DEVICE FOR READING POSITIONAL INFORMATION ON PHOTOGRAPHIC FILMS

Yuji Takenaka, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Apr. 14, 1989, Ser. No. 338,248
Claims priority, application Japan, Apr. 15, 1988, 63-92728
Int. Cl.[5] G03B *27/52*
U.S. Cl. 355—41 **14 Claims**



1. A device for reading positional information on photographic films used for reading, when an elongated photographic film is being fed, pieces of positional information provided on the film in a predetermined order and in correspondence with a plurality of image frames recorded longitudinally on the film, comprising:

determining means for determining whether or not an error has occurred in the reading of the pieces of positional information; and

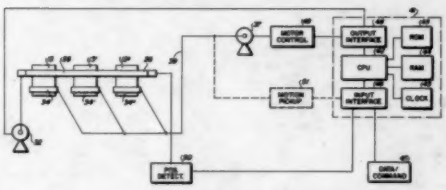
selecting means for selecting, if it is determined by said determining means that an error has occurred in the reading of the positional information, the correct image frame on the basis of those pieces of positional information for image frames which are adjacent to the piece of positional information determined to have been erroneously read.

4,961,087

DIAPHRAGM ADJUSTING ARRANGEMENT IN A PHOTOGRAPHIC ENLARGING OR COPYING APPARATUS HAVING SEVERAL LENSES WITH AN ADJUSTABLE DIAPHRAGM

Mario Gandini, and Franz Obertegger, both of Brixen, Italy, assignors to Durst Phototechnik GmbH, Brixen, Italy

Filed Jun. 29, 1989, Ser. No. 374,236
Claims priority, application Italy, Jul. 3, 1988, 4839 A88
Int. Cl.[5] G03B *27/52*; G02B *7/16*
U.S. Cl. 355—71 **8 Claims**



1. A diaphragm adjusting arrangement in a photographic enlarging or copying apparatus having a plurality of lenses each having an adjustable diaphragm, said diaphragm adjusting arrangement comprising in combination:

a. a motor drive coupled to the diaphragms of the plurality of lenses for commonly adjusting the diaphragms of all of the plurality of lenses;

b. detection means for detecting the actual position of a selected diaphragm, said detection means continuously monitoring the actual position of the selected diaphragm relative to an initial position thereof;

c. input means for receiving data from an operator representing a desired diaphragm position; and

d. a control circuit coupled to said detection means and to said input means for comparing the actual position of a selected diaphragm to the desired diaphragm position, said control circuit generating a control signal for controlling said motor drive for moving the selected diaphragm into the desired position.

4,961,088

MONITOR/WARRANTY SYSTEM FOR ELECTROSTATOGRAPHIC REPRODUCING MACHINES USING REPLACEABLE CARTRIDGES

W. Keith Gilliland, Webster; Christian G. Midgley, Fairport; Francis W. Dana, Ontario, all of N.Y., and Mark C. Mutch, University Heights, Ohio, assignors to Xerox Corporation, Stamford, Conn.

Filed Apr. 20, 1989, Ser. No. 340,994
Int. Cl.[5] G03G *15/00*
U.S. Cl. 355—206 **12 Claims**

1. A monitor/warranty method for an electrostatographic reproducing machine having at least one replaceable cartridge warranted to produce a predetermined number of images, and an operating system for controlling operation of said machine including job programming means for programming image runs, said cartridge including an on-board memory for monitoring cartridge use, comprising the steps of:

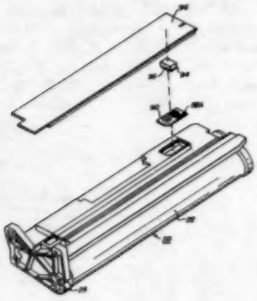
(a) counting the images produced;

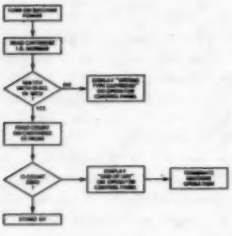
(b) accessing said cartridge memory to obtain a current image count of the number of images remaining on said cartridge and a predetermined termination image count reflecting the maximum number of images that can be produced by said cartridge;

(c) arithmetically updating said current image count with the count of images produced during said run;

(d) storing said updated current image count in said cartridge memory;

(e) comparing said updated current image count with said termination count; and





(f) where said updated current image count is at least equal to said termination count, disabling said cartridge from further use.

4,961,089

METHOD AND APPARATUS FOR WEB TRACKING WITH PREDICTIVE CONTROL

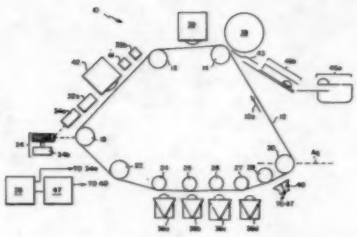
Fereidoon S. Jamzadeh, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

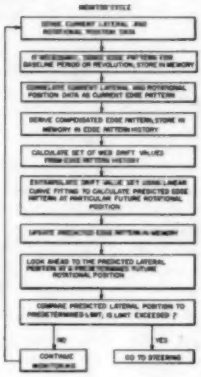
Filed Dec. 27, 1988, Ser. No. 290,718
Int. Cl.[5] G03G *21/00*; B23Q *15/00*
U.S. Cl. 355—207 **37 Claims**

1. A method for controlling operations upon a web moving along a path, the web being subject to lateral movement in a direction transverse to the direction of movement of said web along said path, said method comprising the steps of:

(a) monitoring the lateral position of the web;

(b) generating signals relative to a prediction that the transition of the web's lateral alignment beyond a predetermined allowable limit will occur during a time period or web length required for an operation; and





(c) imposing said correction in advance of said transition.

4,961,090

LARGE MEDIA PROPORTIONAL COPYING SYSTEM

Gerald A. Gray, Jr., Webster, and John L. Webb, Fairport, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Aug. 3, 1989, Ser. No. 389,138
Int. Cl.[5] G03G *13/00, 21/00*
U.S. Cl. 355—50 **15 Claims**

1. A copying system for making large copies of large documents on a large document copier, in which a document is moved past an optical scanning slit by a large document feeder in a copying pass, to form, via a lens system, an image of the document on a copier imaging surface by slit scan exposure of the document while the document is moved past the optical scanning slit at a preset speed proportional to the speed of said imaging surface, and wherein the image of the document on the imaging surface is transfer copied onto a selected large sheet or web copy media to form a copy image thereon;

the improvement in controlling and adjusting the size of the copy image relative to the document image, including compensation for copy media dimensional changes due to said copying, by controlled adjustment of the magnification or reduction of the document image, without anamorphic or other lens changes, comprising the steps of:

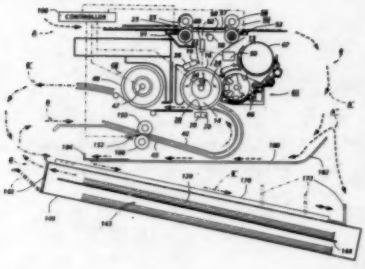
making a test copy of the document onto the selected large copy media said large document copier;

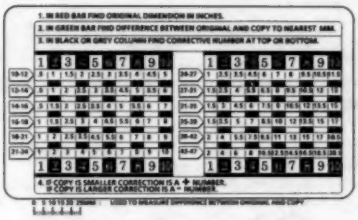
measuring the dimensional change in the copy image on said

selected large copy media, relative to said document image, in the direction of movement;

deriving a correction factor corresponding to said measured dimensional change;

entering said correction factor into a variable speed control for said large document feeder to reset the speed of said movement of the document past said optical scanning slit





by an amount proportional to said correction factor, to provide a corresponding image reduction or magnification dimensional change of the copy image on the copy media in the direction of movement;

and making a subsequent copy on said large copy media with said document moving past said optical scanning slit at said reset speed.

4,961,091

SHEET RECEIVING DEVICE

Michio Kasuya, Chofu, and Akihiro Tomoda, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 1, 1989, Ser. No. 304,481

Claims priority, application Japan, Feb. 2, 1988, 63-22455; Feb. 2, 1988, 63-22456; Nov. 25, 1988, 63-299071

Int. Cl.[5] B65H *31/00*; G03G *15/00*

U.S. Cl. 355—321 **23 Claims**

15. An image forming apparatus having:

sheet receiving means for receiving sheets;

first conveying means for conveying the sheets received in said sheet receiving means;

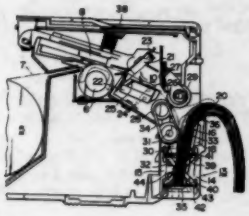
image forming means for forming an image on the sheets conveyed by said first conveying means;

second conveying means for conveying the sheets having an image formed thereon by said image forming means downwardly;

first guide means for guiding the sheets downwardly;

second guide means for holding the sheets cooperating with said first guide means; and

support means for movably supporting at least said first or second guide means so that the distance therebetween can increase with the sheets held therebetween, in conformity with an increase in the sheets held between said first and second guide means, without changing the posture of said first and second guide means in the direction of the thick-



ness of the sheets held between said first and second guide means.

4,961,092

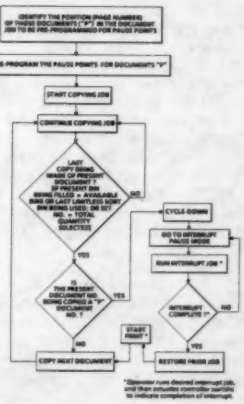
PRE-PROGRAMMED PAUSES POST-COLLATION COPYING SYSTEM

Khalid M. Rabb, Webster; Robert L. Sklut, and John W. Daughton, both of Rochester, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Dec. 6, 1989, Ser. No. 446,961

Int. Cl.[5] G03G *21/00*

U.S. Cl. 355—323 **9 Claims**



1. In a method of post-collation copying a set of original document sheets with an automatic recirculating document handler on a copier with an operatively connecting plurality of sorter bins for post-collation of the copy sheets made therefrom into copy sets, to make a desired total number of copy sets, the improvement comprising:

pre-programming selected pause points associated with selected said document sheets for automatically pausing said copying for inserts for said copy sets;

circulating the document sheets with said recirculating document handler to and from the copying station of the copier for producing a subset plural number of copies per document sheet per document circulation and sorting those subset copies by feeding them into a subset of plural said sorter bins less than the total number of said connecting plurality of sorter bins, and repeating said production of copy subsets a variable number of times until the desired total number of copy sets has been made;

automatically pausing said copying for said pre-programmed

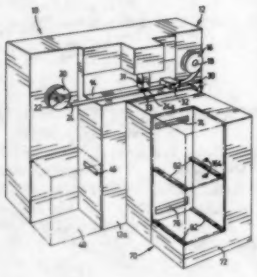
selected pause points associated with said selected document sheets at actual pause points which are also appropriate for inserts for said subset plural number of copies being made at that pause point, and repeatedly automatically so pausing at said pre-programmed selected pause points for said repeated production of copy subsets.

4,961,093

PHOTO-PROCESSING DEVICE

Frank W. McDonald, Toronto, Canada, assignor to Black Photo Corporation, Ontario, Canada

Filed Jan. 8, 1990, Ser. No. 462,038
Claims priority, application Canada, Jan. 10, 1989, 587887
Int. Cl.[5] G03B *29/00*
U.S. Cl. 355—29 **23 Claims**



1. An apparatus adapted to be coupled to a photo-processing device, said photo-processing device for forming exposures of negatives of a pre-determined size, said apparatus comprising:

a housing receiving a supply of unexposed paper;

drive means for advancing said paper through said housing upon exposure of a negative thereon; and

reflection means positioned in said photo-processing device, said reflection means receiving a focussed light beam after said light beam has passed through a negative and directing said focussed light beam into said housing and onto said paper to form an exposure of said negative of a size different than said pre-determined size.

4,961,094

ELECTROSTATIC RECORDING APPARATUS AND METHOD FOR PRODUCING COLOR IMAGES

Toshihiko Yamaoki, Osaka; Kenichiro Wakisaka, Hirakata; Kouji Minami, Higashiosaka, and Masayuki Iwamoto, Itami, all of Japan, assignors to Sanyo Electric Co., Ltd., Osaka, Japan

Filed May 31, 1988, Ser. No. 200,660
Claims priority, application Japan, Jun. 3, 1987, 62-139231; Oct. 16, 1987, 62-262447; Oct. 16, 1987, 62-262448
Int. Cl.[5] G03G *15/01*
U.S. Cl. 355—326 **24 Claims**

3. An electrostatic recording apparatus, comprising:

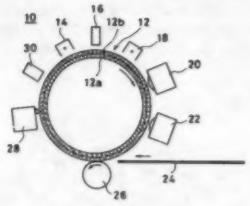
a photosensitive member capable of being charged in both polarities;

first charging means for charging said photosensitive member in one polarity;

exposing means for forming electrostatic latent images of two gradations having voltages different from each other by irradiating light images having two kinds of the light intensity different from each other to said photosensitive member being charged by said first charging means;

second charging means for charging said photosensitive member in the reverse polarity opposite to the polarity of said first charging means such that the voltages of said electrostatic latent images of two gradations become in opposite polarities to each other; and

developing means for developing the two electrostatic latent images of two gradations being formed on said photosensitive member and having the voltages in opposite polarities



to each other immediately after said photosensitive member was charged by said second charging means.

4,961,095

SEMICONDUCTOR MEMORY DEVICE WITH WORD LINES ADJACENT AND NON-INTERSECTING WITH CAPACITOR GROOVES

Koichiro Mashiko, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 946,915, Dec. 22, 1986, abandoned.
This application Feb. 22, 1989, Ser. No. 314,242
Claims priority, application Japan, Dec. 25, 1985, 60-294125
Int. Cl.[5] H01L *29/78, 29/06*
U.S. Cl. 357—23.6 **11 Claims**

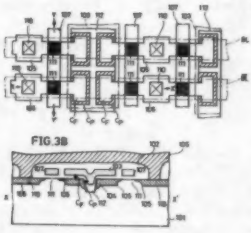


FIG.3B

1. A semiconductor memory device formed on a semiconductor substrate (**101**), comprising:

a plurality of word lines (**107**) disposed in parallel with each other,

a plurality of bit lines (**106**) disposed so as to intersect said word lines,

a plurality of memory cells (C_F), (C_P) formed at the respective intersections between said word lines and said bit lines and disposed regularly along an elongate direction of said word lines at alternate regions between respective word lines, and

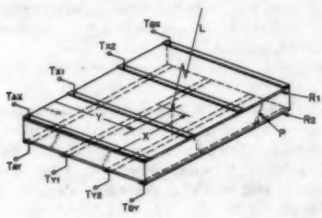
a grooved separating region (**112**) formed extending between adjacent memory cells, said grooved separating region being provided only in a non-overlapping relation with said word lines and having a portion of information electric charge storing capacitances of the respective memory cells formed on side surfaces thereof.

4,961,096

SEMICONDUCTOR IMAGE POSITION SENSITIVE DEVICE WITH PRIMARY AND INTERMEDIATE ELECTRODES

Masanori Idesawa, Wako, Japan, assignor to Rikagaku Kenkyusho, Saitama, Japan

PCT No. PCT/JP88/00662, § 371 Date Feb. 27, 1989, § 102(e) Date Feb. 27, 1989
PCT Filed Jul. 1, 1988, Ser. No. 320,305
Claims priority, application Japan, Jul. 2, 1987, 62-165969
Int. Cl.[5] H01L 27/14
U.S. Cl. 357—30 9 Claims



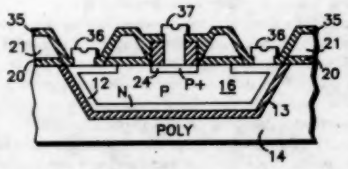
1. An image position sensitive device, comprising:
photosensitive means, having a surface on which an image may be projected, for generating a photocurrent in response to the image and for conducting said current subject to a resistance characteristic;
a plurality of primary electrode means, bounding an image sensitive region of said photosensitive means, for coupling image representation currents; and
at least one intermediate electrode means, coupled to said photosensitive means intermediate said primary electrode means, for coupling image representative currents;
whereby said image sensitive region is sectioned by said intermediate electrode means so that image position may be roughly determined by ratio evaluations based on image currents coupled by the primary electrode means and more accurately determined by ratio evaluations using image currents coupled by intermediate electrode means.

4,961,097

HIGH FREQUENCY PHOTO DETECTOR AND METHOD FOR THE MANUFACTURE THEREOF

Hassan Pirastehfar, Mesa; George C. Onodera; Waisiu Law, both of Phoenix, and David M. Heminger, Mesa, all of Ariz., assignors to Motorola Inc., Schaumburg, Ill.

Filed Mar. 11, 1985, Ser. No. 710,781
Int. Cl.[5] H01L 27/14
U.S. Cl. 357—30 5 Claims



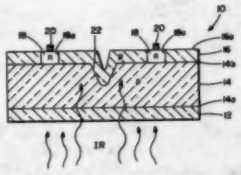
1. A photo detector comprising:
a body of polycrystalline semiconductor material having a major face and a surface defining a first tub therein;
an isolation region being disposed about said surface of said body defining the first tub and having a surface defining a second tube;
a first region of a monocrystalline semiconductor material having a first conductivity type, said first region being disposed about said surface of said isolation region defining the second tub and have a surface defining a third tub;
a second region of said monocrystalline semiconductor material having a second conductivity type, said second region being disposed within the third tub defined by said first region and having a major face coincident with said major face of said body;
a third region of said monocrystalline semiconductor material having said first conductivity type and being disposed in said second region such that a major face of said third region is coincident with said major face of said body and said third region is connected to said first region; and
a forth region of said monocrystalline semiconductor material having said second conductivity type and being disposed in said second region such that a major face of said forth region is coincident with said major face of said body.

4,961,098

HETEROJUNCTION PHOTODIODE ARRAY

Joseph P. Rosbeck, Santa Barbara, and Charles A. Cockrum, Goleta, both of Calif., assignors to Santa Barbara Research Center, Goleta, Calif.

Filed Jul. 3, 1989, Ser. No. 375,229
Int. Cl.[5] H01L 27/14
U.S. Cl. 357—30 20 Claims



1. An array of photovoltaic radiation detectors comprising:
a compositionally graded radiation absorbing base layer having a first surface and a first type of electrical conductivity, the base layer absorbing the radiation and generating charge carriers therefrom, an energy bandgap of the base layer decreasing in width as a function of distance from the first surface;
a cap layer overlying a second surface of the radiation absorbing layer, the cap layer being a compositionally graded layer and having an energy bandgap that increases in width as a function of distance from the second surface; and
a plurality of regions of opposite conductivity to the base layer formed through a top surface of and substantially wholly within the cap layer, each of the regions forming a p-n junction with surrounding material for collecting the charge carriers; and wherein
the array further includes grooves underlying the cap layer and formed through the second surface of the base layer to a predetermined depth that is less than a thickness of the base layer, individual grooves being disposed between individual adjacent ones of the p-n junctions, the predetermined depth being sufficiently deep to substantially prevent the lateral diffusion of charge carriers from a portion of the base layer adjacent to a p-n junction to another portion of the base layer adjacent to another p-n junction.

4,961,099

HIGH-POWER GTO THYRISTOR AND ALSO A METHOD FOR ITS MANUFACTURE

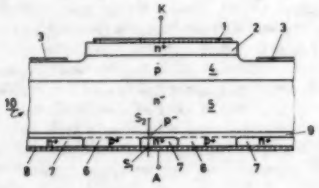
Peter Roggwiller, Riedt-Neerach, Switzerland, assignor to Asea Brown Boveri Ltd., Baden, Switzerland

Filed Feb. 10, 1989, Ser. No. 308,534

Claims priority, application Switzerland, Feb. 12, 1988, 520/88

Int. Cl.[5] H01L *29/74*

U.S. Cl. 357—38 **5 Claims**



1. High-power GTO thyristor having a cathode and an anode, comprising:

a layer sequence comprising an n-type emitter layer, a p-type base layer, an n-type base layer and a p-type emitter layer between the cathode and the anode in a semiconductor substrate;

the p-type emitter layer being perforated by anode short-circuits, which anode short-circuits short-circuit the n-type base layer to the anode;

wherein:

a p^--type barrier layer is disposed at least inside a region carrying an on-state current between the anode short-circuits and the n-type base layer;

said p^--type barrier layer has a doping concentration of less than $10^{15}cm^{-3}$.

4,961,100

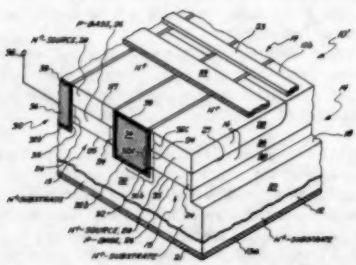
BIDIRECTIONAL FIELD EFFECT SEMICONDUCTOR DEVICE AND CIRCUIT

Bantval J. Baliga, Schenectady; Hsueh-Rong Chang, Scotia, both of N.Y., and Edward K. Howell, Simsbury, Conn., assignors to General Electric Company, Schenectady, N.Y.

Filed Jun. 20, 1988, Ser. No. 208,448

Int. Cl.[5] H01L *29/747, 29/74, 29/10*

U.S. Cl. 357—39 **7 Claims**



1. A field effect semiconductor device comprising:

a semiconductor body having first and second, opposed major surfaces including:

a first main terminal region of one conductivity type extending to said first major surface of said body,

a second main terminal region of said one conductivity type extending to said second main surface of said body, and

a base region of an opposite conductivity type disposed between and spacing apart said first and second main terminal regions and having a channel portion extending to said first surface of said semiconductor body;

an insulated gate electrode disposed on said first surface adjacent to said base region between said first and second main terminal regions for controlling the conductivity of said channel portion between said first and second main terminal regions for carriers of said one conductivity type;

a first main electrode disposed on said first major surface and ohmically connected to said first main terminal region;

a second main electrode disposed on said second major surface and ohmically connected to said second main terminal region; and

a base electrode ohmically connected to said base region; and

said device being free of first main terminal region-to-base region and second main terminal region-to-base region short circuits whereby said device is bidirectional and the conductivity of said channel region is determined by the potential of said insulated gate electrode relative to said base region.

4,961,101

SEMICONDUCTOR MOSFET DEVICE WITH OFFSET REGIONS

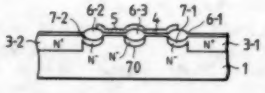
Ching Fa Yeh, and Yuji Yatsuda, both of Kanagawa, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Apr. 20, 1988, Ser. No. 183,847

Claims priority, application Japan, Apr. 21, 1987, 62-98109

Int. Cl.[5] H01L *27/12*

U.S. Cl. 357—49 **5 Claims**



1. A semiconductor device including a plurality of planar high-voltage insulated-gate FETs, said FETs comprising:

a semiconductor substrate;

a plurality of drain regions disposed in said substrate and having a first impurity concentration level;

a plurality of source regions disposed in said substrate, each source region being adjacent to but spaced from an associated drain region;

a gate oxide film on a surface of said semiconductor substrate;

gate electrodes disposed on said gate oxide film;

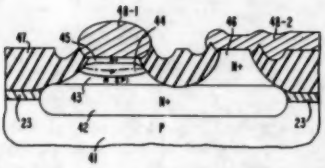
a plurality of first offset regions of the same conductivity type as the drain regions and having a second impurity concentration level different from said first impurity concentration level of the drain regions, each first offset region being contiguous to an associated drain region and near said surface of said semiconductor substrate; and

a plurality of LOCOS insulation films which are provided on said plurality of first offset regions.

4,961,102
JUNCTION PROGRAMMABLE VERTICAL TRANSISTOR WITH HIGH PERFORMANCE TRANSISTOR

Jay A. Shideler, 11 Murphy Pl., San Mateo, Calif. 94402, and Umeshwar D. Mishra, 1623 Crow Ct., Sunnyvale, Calif. 94087

Continuation of Ser. No. 892,979, Aug. 4, 1986, abandoned, which is a division of Ser. No. 770,355, Aug. 27, 1985, Pat. No. 4,624,046, which is a continuation of Ser. No. 336,802, Jan. 4, 1982, abandoned. This application Oct. 7, 1988, Ser. No. 256,213
Int. Cl.[5] H01L *29/90, 29/72, 27/02*
U.S. Cl. 357—51 **13 Claims**



8. An avalanche programmable junction semiconductor device comprising:

a collector region of a first conductivity type;

an active base region of a second conductivity type formed above the collector region and having an interface with the collector region;

an emitter of first conductivity type formed above the active base region and having an interface with the active base region;

thermally grown oxide insulation laterally encircling the base and emitter regions;

the active base region having three portions, a first portion having a net doping concentration profile peak located between the collector-base interface and the emitter-base interface and a second portion, located within the first portion, of second conductivity type formed beneath and adjacent to the emitter region and separating the emitter region from the collector region adjacent to the oxide insulation, wherein the second portion has impurities of second conductivity type sufficient to reduce I_{CEO} leakage; and

a third portion, located within the first portion of the active base region, positioned between the active base-emitter interface and the collector-base interface, with second conductivity type impurities so that the beta of the device is reduced and the collector-to-emitter breakdown voltage with base open is increased by an amount sufficient for the device to be used as a junction programmable vertical fuse.

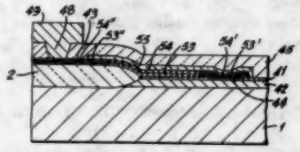
4,961,103
SEMICONDUCTOR DEVICE HAVING POLYCRYSTALLINE SILICON RESISTOR

Manzoh Saitoh, and Kenji Okamura, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Nov. 23, 1988, Ser. No. 276,108
Claims priority, application Japan, Nov. 27, 1987, 62-300905
Int. Cl.[5] H01L *27/02, 29/34, 29/04, 23/48*
U.S. Cl. 357—59 **9 Claims**

1. A semiconductor device comprising a semiconductor substrate having a major surface; an insulating layer formed on said major surface of said substrate and having an upper surface; a silicon resistor element formed on said upper surface of said insulating layer and having a specified resistance value; first and second connecting portions connected to respective ends of said silicon resistor element and each formed on said upper surface of said insulating layer; an insulating film formed on said silicon resistor element; and first and second metallic wiring layers connected to said first and second connecting portions, respectively;

said silicon resistor element including a first polycrystalline silicon film having an upper face and containing oxygen of at most 15 atomic percents and being formed on said upper surface of said insulating layer with a thickness ranging from 100 Å to 1000 Å for determining substantially said specified resistance value of said silicon resistor element, and a second polycrystalline silicon film having a top face and containing oxygen of at least 20 atomic percents and being attached to said upper face of said first polycrystalline silicon film for protecting said upper face of said first polycrystalline silicon film from thermal oxidation;



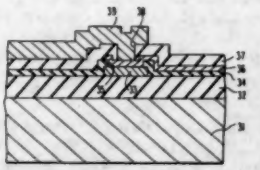
said insulating film being a silicon oxide film thermally converted from said second polycrystalline silicon film of said silicon resistor element and attached to said top face of said second polycrystalline silicon film of said silicon resistor elements; and

each of said first and second connecting portions including a first polycrystalline silicon film continuously formed from said first polycrystalline silicon film of said silicon resistor element and a second polycrystalline silicon film continuously formed from said second polycrystalline silicon film of said silicon resistor element so that said first and second connecting portions have the same film construction as said silicon resistor element and are connected to said first and second metallic wiring layers on said upper surface of said insulating layer, respectively.

4,961,104
MULTI-LEVEL WIRING STRUCTURE OF SEMICONDUCTOR DEVICE

Noboru Hirakawa, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Apr. 25, 1988, Ser. No. 185,742
Claims priority, application Japan, Apr. 24, 1987, 62-102413
Int. Cl.[5] H01L *23/48*
U.S. Cl. 357—71 **6 Claims**



1. A multi-level wiring structure incorporated in a semiconductor device fabricated on a semiconductor substrate, comprising:

(a) a first insulating layer formed on said semiconductor substrate;

(b) a first wiring layer of a preselected conductive material formed on said first insulating layer;

(c) a second insulating layer of a preselected insulating material covering said first wiring layer and having a first

contact opening exposing a central area of an upper surface of said first wiring layer;

(d) a high-resistive second wiring layer formed on said second insulating layer in such a manner as to contact with said first wiring layer through said first contact opening and having a small thickness;

(e) a third insulating layer covering said high-resistive second wiring layer and having a second contact opening nested with respect to said first contact opening and partially exposing a central area of an upper surface of said high-resistive second wiring layer; and

(f) a third wiring layer formed on said third insulating layer in such a manner as to contact with said high-resistive second wiring layer through said second contact opening, wherein an etchant used for formation of said second contact opening has an etching rate for said preselected conductive material smaller than that for said preselected insulating material.

4,961,105

ARRANGEMENT OF A SEMICONDUCTOR DEVICE FOR USE IN A CARD

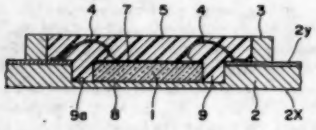
Hiroshi Yamamoto, Ibaragi, Japan, assignor to Hitachi Maxell, LTD, Osaka, Japan

Continuation of Ser. No. 11,197, Feb. 5, 1987, abandoned. This application Jan. 23, 1989, Ser. No. 299,609

Claims priority, application Japan, Feb. 6, 1986, 61-22960

Int. Cl.[5] H01L *23/28*

U.S. Cl. 357—72 **23 Claims**



1. A card like semiconductor device comprising:

a silicon semiconductor pellet having semiconductor circuitry on a top surface and a metal reinforcing layer forming a bottom surface, said metal reinforcing layer including a silicon alloy layer being diffused to said bottom surface;

a plastic resin circuit board having a relatively thin pellet securing surface on which said metal reinforcing layer forming the bottom surface of said silicon semiconductor pellet is bonded by an organic adhesive;

a high polymer material for sealing said silicon semiconductor pellet to said plastic resin circuit board; and

said metal reinforcing layer stiffening the mechanical strength of said silicon semiconductor pellet so that the relatively thin pellet securing surface of said plastic resin circuit board is reinforced and thereby allows said semiconductor device to be formed of a reduced thickness.

4,961,106

METAL PACKAGES HAVING IMPROVED THERMAL DISSIPATION

Sheldon H. Butt, Godfrey, Ill., and Deepak Mahulikar, Meriden, Conn., assignors to Olin Corporation, New Haven, Conn.

Continuation-in-part of Ser. No. 30,522, Mar. 27, 1987, abandoned. This application Aug. 31, 1987, Ser. No. 91,470

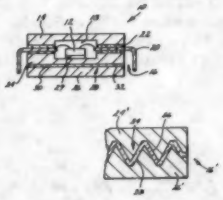
Int. Cl.[5] H01L *23/02, 23/12*

U.S. Cl. 357—74 **40 Claims**

1. A package adapted to encase an electronic component, comprising:

a metallic base component split into first and second base layers, said first and second base layers bonded together at an interface with a layer of electrically insulating sealing material wherein said interface is non-planer and increases the area of contact between said first and second base layers;

a metallic lid component disposed on said base component so as to form an enclosure adapted to receive said electronic component;



a metallic leadframe, said leadframe being disposed between said lid component and said base component; and

a sealing material sealing said lid component to said base component with said leadframe there between.

4,961,107

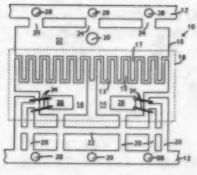
ELECTRICALLY ISOLATED HEATSINK FOR SINGLE-IN-LINE PACKAGE

Henry E. Geist, Scottsdale, and Eugene E. Segerson, Tempe, both of Ariz., assignors to Motorola Inc., Schaumburg, Ill.

Filed Apr. 3, 1989, Ser. No. 331,716

Int. Cl.[5] H01L *23/40, 23/36*

U.S. Cl. 357—81 **15 Claims**



1. An electronic device comprising a metallic member having a die mount portion and a heat spreader portion which are electrically isolated, wherein the die mount portion and the heat spreader portion each have multiple fingers extending toward the other which are interleaved without touching, and a thermally conductive, electrically insulating material surrounding and separating the interleaved fingers, wherein the interleaved fingers lie in substantially the same plane.

4,961,108

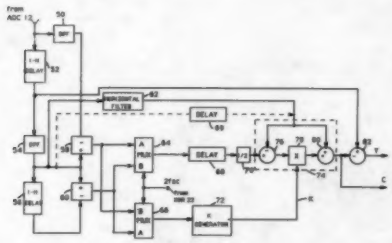
CIRCUITRY FOR COMB FILTERING PAL AND NTSC VIDEO SIGNALS

Stuart S. Perlman, Princeton, N.J., assignor to RCA Licensing Corporation, Princeton, N.J.

Filed Oct. 24, 1988, Ser. No. 261,522

Int. Cl.[5] H04N *9/78*

U.S. Cl. 358—31 **11 Claims**



1. Comb filter apparatus comprising:

a signal input terminal for providing an input video signal;

means coupled to said signal input terminal for concurrently providing video signals from three successive horizontal lines designated top, middle and bottom;

means including combining means responsive to said video signals from said top, middle and bottom lines for providing a comb filtered signal representing said middle line, said comb filtered signal including said video signal from said middle line alternately combined at regular intervals less than a line interval, with said video signals from said top and bottom lines.

4,961,109

CHARGEABLE PROGRAM RECEIVING LIMIT SETTING SYSTEM IN TWO-WAY CABLE TELEVISION SYSTEM

Hideo Tanaka, Tokyo, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Continuation of Ser. No. 13,101, Feb. 10, 1987, abandoned. This application Jun. 27, 1989, Ser. No. 372,154

Claims priority, application Japan, Feb. 10, 1986, 61-27518

Int. Cl.[5] H04N *7/10, 7/16*

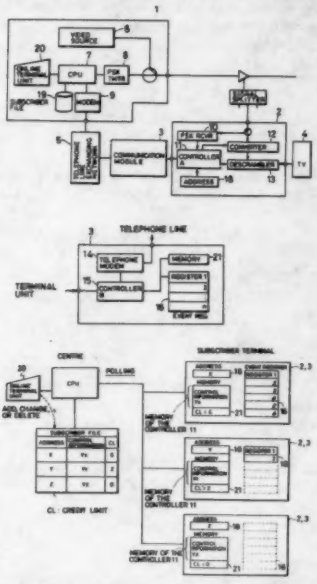
U.S. Cl. 358—84 **5 Claims**

1. In a cable television system having a two-way data communication, a chargeable program receiving limit setting system, comprising:

a plurality of terminal units assigned to a plurality of respective subscribers; and

a central facility including a subscriber file for storing respective credit limits which represent predetermined numbers chargeable programs which may be received by respective ones of said subscribers, and a central processing unit for transmitting said respective credit limits in a command format to said terminal units;

wherein each of said terminal units includes an event register for storing a history of chargeable programs having been received. each said event register including a plurality of locations each for storing an indication of a program having been received, a limit memory for storing a respective one of said respective credit limits transmitted from said central facility, and a controller for changing a logical range of use of the locations of said event register according to said credit limit stored in said limit memory; and



wherein different chargeable program receiving limits can be provided by said central facility to respective ones of said subscribers.

4,961,110

ENDOSCOPE APPARATUS

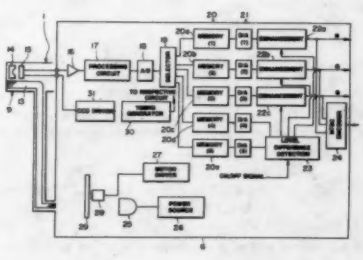
Kazunari Nakamura, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Jul. 7, 1989, Ser. No. 376,461

Claims priority, application Japan, Nov. 2, 1988, 63-277917; Apr. 20, 1989, 1-101075

Int. Cl.[5] A61B *1/04, 1/06*

U.S. Cl. 358—98 **23 Claims**



1. An endoscope apparatus comprising:

an endoscope having at least an image forming optical system;

a wavelength separating means for separating an observed object image into images of a plurality of wavelength ranges;

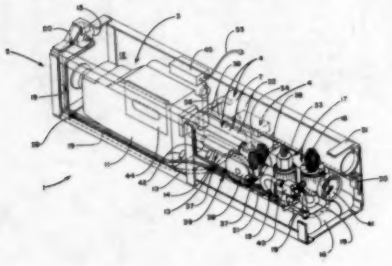
an imaging means for imaging the images of the respective wavelength ranges formed by said image forming optical system and separated by said wavelength separating means; and

a signal processing means for forming at least one new image on the basis of the images of at least two wavelength ranges among said images of the respective wavelength ranges imaged by said imaging means and forming an observed image on the basis of at least one image including said new image.

4,961,111
VIDEO INSPECTION SYSTEM FOR HAZARDOUS ENVIRONMENTS

Nils G. Herlitz; Karl L. Igiehart, and John S. Sentell, all of Baton Rouge, La., assignors to Safe T. V., Inc., Baton Rouge, La.

Filed Jul. 21, 1989, Ser. No. 383,182
Int. Cl.[5] H04N *7/18*
U.S. Cl. 358—100 **20 Claims**



1. A video inspection system for hazardous environments, comprising:

a. a housing, sealable so as to contain a pressurized gas therein, having a view opening therein and further including:

i. a means for introducing pressurized gas into said housing, connected to said housing; and

ii. a transparent lens, sealingly affixed across said view opening;

b. a camera means for recording visual images through said view opening, mounted within said housing; and

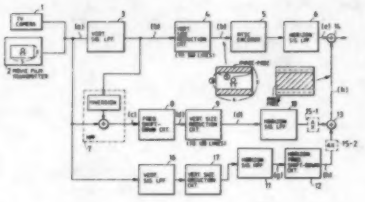
c. a power supply, for powering said camera means, mounted within said housing and operatively connected to said camera means.

4,961,112
TELEVISION SYSTEM

Yoshio Sugimori; Youssi Araki, and Joji Urano, all of Tokyo, Japan, assignors to Nippon Television Network Corporation, Tokyo, Japan

Filed Jan. 19, 1989, Ser. No. 299,120
Claims priority, application Japan, Oct. 22, 1988, 63-266848
Int. Cl.[5] H04N *7/01*
U.S. Cl. 358—141 **4 Claims**

1. A television signal transmission system in which a laterally long image is transmitted and displayed on a screen of a television receiver having an aspect ratio of 3:4 , with a top and bottom image-free portion on said screen, auxiliary signal for improving a resolution of the image displayed on said screen being inserted into said top and said bottom image-free portions, said auxiliary signal including a first signal obtained by shifting a frequency of a vertical signal component corresponding to a difference between vertical frequency bands determined by the total number of raster scan lines of said television screen and by the number of raster scan lines corresponding to a height of said image on said screen, respectively, down and a second signal obtained by shifting a frequency of a horizontal signal component exceeding a horizontal frequency band determined by a lateral length of said image on

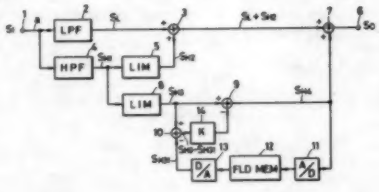


said screen corresponding to a length of a raster scan line down.

4,961,113
NOISE REDUCTION CIRCUIT

Takashi Okada; Masumi Ogawa, both of Kanagawa; Mitsuyasu Asano, Tokyo, and Masaru Nonogaki, Kanagawa, all of Japan, assignors to Sony Corporation, Tokyo, Japan

PCT No. PCT/JP88/00288, § 371 Date Jan. 10, 1989, § 102(e) Date Jan. 10, 1989, PCT Pub. No. WO88/07309, PCT Pub. Date Sep. 22, 1988
PCT Filed Mar. 18, 1988, Ser. No. 294,699
Claims priority, application Japan, Mar. 19, 1987, 62-65067
Int. Cl.[5] H04N *5/213*
U.S. Cl. 358—167 **12 Claims**



1. A method of reducing noise in a video signal comprising the steps of:

dividing said video signal into a first signal containing the low frequency component of said video signal and a second signal containing the high frequency component of said video signal;

dividing said second signal into a third signal having an amplitude more than a predetermined value and a fourth signal having an amplitude less than said predetermined value and containing noise;

reducing noise in said fourth signal by means of a delay circuit to create a fifth signal; and

adding said first, third and fifth signals together.

4,961,114
DIGITAL MEMORY DELAY LINE FOR A VIDEO BORDER GENERATOR

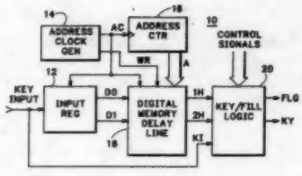
Charles White, Bensalem, Pa., assignor to The Grass Valley Group, Inc., Nevada City, Calif.

Filed Mar. 27, 1989, Ser. No. 328,923
Int. Cl.[5] H04N *5/262*
U.S. Cl. 358—183 **15 Claims**

1. An apparatus for delaying a key signal comprising:

means for sampling the key signal to form m-bit data words, each bit representing one sample of the key signal;

means for delaying the m-bit data words by a predetermined time; and



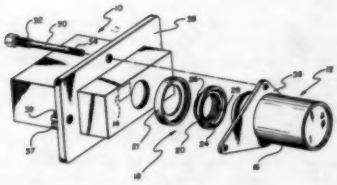
means for demultiplexing the delayed m-bit data words to reproduce the key signal delayed by the predetermined time.

4,961,115

LENS ADJUSTMENT APPARATUS

Thomas C. Jessop, Webster, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 3, 1989, Ser. No. 292,687
Int. Cl.[5] H04N *3/14*
U.S. Cl. 358—229 **10 Claims**



1. Apparatus for adjustably supporting a lens assembly on the housing of a camera containing an image sensor, comprising:

flexure means positioned between the lens assembly and housing for permitting universal displacement of the lens assembly relative to the housing; and

a pair of compound screws each having two threaded portions of different pitch, one portion of each screw being threaded in said housing and the other portion being threaded in said lens assembly, said screws being angularly spaced relative to the optical axis of said lens assembly to provide for displacement of the lens assembly relative to the camera by said flexure means.

4,961,116

METHOD OF, AND APPARATUS FOR, FACILITATING SYCHRONIZATION OF RECORDED AUDIO AND VIDEO INFORMATION

Hitoshi Kanamaru, and Tsuyoshi Watanabe, both of Saitama, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Nov. 19, 1987, Ser. No. 122,811
Claims priority, application Japan, Nov. 19, 1986, 61-277557
Int. Cl.[5] H04N *5/76*
U.S. Cl. 358—343 **11 Claims**

1. A method for recording video information divided into a plurality of blocks together with audio information divided into a plurality of blocks corresponding to those of said video information in a multiplex manner on a recording medium, comprising the steps of:

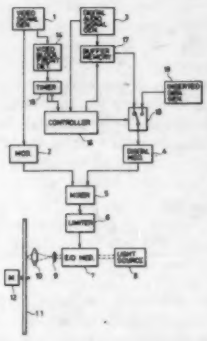
(a) storing a first block of said audio information received from an audio information source;

(b) detecting the start of recording of a block of said video information one block preceding the stored first block of said audio information;

(c) starting the recording of said first block of said audio information;

(d) storing a second, next subsequent block of said audio information;

(e) at the end of recording of said first block of said audio information, determining whether a remaining time for



recording of said block of said video information is greater than a predetermined value;

(f) if said remaining time is greater than said predetermined value, holding said second block of said audio information and recording a block of inserted data for said audio information; and

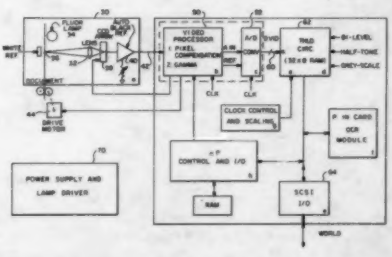
(g) if said remaining time is less than said predetermined value, reading out and recording said second block of said audio information.

4,961,117

DOCUMENT SCANNER

Stuart D. Rumley, Redwood City, Calif., assignor to New DEST Corporation, San Jose, Calif.

Filed Nov. 13, 1987, Ser. No. 117,971
Int. Cl.[5] H04N *1/04*
U.S. Cl. 358—461 **5 Claims**



1. A document scanner comprising

means for scanning a document having graphics or text information thereon in order to generate analog video signals representative of said information,

video processing means for processing said analog video signals to generate digital video signals corresponding to said analog signals wherein said video processing means include adaptive pixel compensation means for providing pixel compensation for each pixel corresponding to said analog video signals in a real time fashion, said adaptive

pixel compensation means including means for generating a variable value signal having predetermined values between a first value and a second value, and means for multiplying said variable value signal and said analog video signals to provide said pixel compensation for each said pixel,

optical imaging means for generating said analog video signals including means for generating a black reference pulse signal and a closed loop servo circuit responsive to said output video signals to a DC reference point.

means for scanning said document having graphics or text information thereon in order to generate analog video signals representative of said information.

said video processing means including means for processing said analog video signals to generate digital video signals corresponding to said analog signals wherein said video processing means include adaptive pixel compensation means for providing pixel compensation for each pixel corresponding to said analog video signals in a real time,

optical imaging means for generating said analog video signals, said optical imaging means including fluorescent lamps and control means for controlling said fluorescent lamps,

means for preheating the filaments of said fluorescent lamps during a predetermined time frame, and

means for initiating a first oscillating mode of operation such that only said filaments are preheated wherein said optical imaging means include means for switching to a second frequency mode of operation for operating said fluorescent lamp.

4,961,118

DOCUMENT SCANNER DRIVEN BY ELECTROMAGNETIC ACTUATORS

Takaharu Ueda; Tetsu Yamamoto; Manabu Ogura, and Takashi Yumura, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

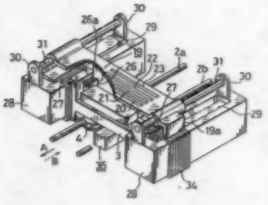
PCT No. PCT/JP88/00273, § 371 Date Mar. 15, 1989, § 102(e) Date Mar. 15, 1989

PCT Filed Mar. 16, 1988, Ser. No. 265,454

Claims priority, application Japan, May 29, 1987, 62-135456; May 29, 1987, 62-135457

Int. Cl.[5] **H04N** *1/10*

U.S. Cl. 358—497 **6 Claims**



1. A two-dimensional image pick-up device comprising:

an optical system for producing an image;

a one-dimensional image pick-up element, arranged to receive at least part of said image, for scanning said at least part of said image in a main scanning direction;

an element moving carriage on which said one-dimensional image pick-up element is mounted;

first and second linear motors, respectively disposed on either side in said main scanning direction of said element moving carriage, each having a stationary magnetic circuit element disposed in a subscanning direction orthogonal to said main scanning direction and a movable coil coiled around said magnetic circuit element, for moving said element moving carriage linearly in said subscanning direction in response to application of an electric current to said movable coil.

4,961,119

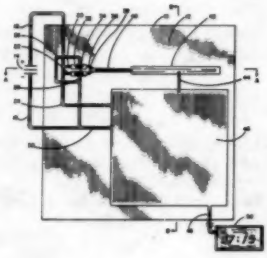
HARMONIC OPTICAL OSCILLATOR

Ernest E. Irish, 4019 Tacoma Ave., Las Vegas, Nev. 89121

Continuation-in-part of Ser. No. 866,251, May 23, 1986, abandoned. This application Oct. 19, 1987, Ser. No. 110,923

Int. Cl.[5] **G04F** *8/00, 5/00*

U.S. Cl. 368—156 **11 Claims**



1. A time and frequency standard comprising a microchip base, a first semiconductor laser means integrated on the base producing a first coherent infrared beam, a second semiconductor laser means integrated on the base producing a second coherent infrared beam, said first and second beams having a wavelength difference of at least 2 nanometers, an optic waveguide means integrated on the base laid out in an open path for converging said first beam and said second beam into a single beam, a light detecting means integrated on the base for detecting the light modulation in the said single beam resulting from the interference produced by the convergence of the first and second beam, the light detecting means producing an electrical signal at a fixed clock rate, and a processing means integrated on the base for converting said clock rate signal to a desired output time and frequency signal, said optic waveguide means being completely integrated on the microchip base and extending between both the first and second semiconductor laser means and the light detecting means.

4,961,120

RECORDING AND/OR REPRODUCING APPARATUS WITH ROTARY HEAD FOR MAGNETIC TAPE CASSETTE

Tatsuya Mototake, Tokyo; Tatsuyuki Outou, Kanagawa; Yoshinori Yamamoto, Kanagawa, and Kenji Kawakami, Kanagawa, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Jul. 14, 1988, Ser. No. 218,912

Int. Cl.[5] **G11B** *5/027*

U.S. Cl. 360—85 **30 Claims**

1. A recording and/or reproducing apparatus for a magnetic tape cassette comprising:

a capstan rotatable about its axis clockwise and counterclockwise;

a pinch roller rotatably cooperating with said capstan to feed a magnetic tape wound on a pair of tape reels housed in a cassette casing of said magnetic tape cassette;

reel base means for receiving said magnetic tape cassette to drivingly cooperate therewith, said reel base means including a pair of reel bases engageable with said pair of tape reels;

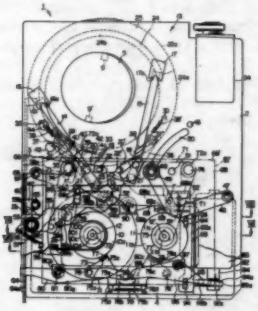
tape loading means for extracting said tape from said tape cassette;

braking means associated with said pair of reel bases for

applying braking force onto said pair of reel bases so as to restrict rotation thereof;

first means engageable with a first link member to release said braking force in a tape load mode wherein said tape is loaded by said tape loading means and in a first operational mode wherein said magnetic tape is run at a predetermined first speed by either of said pair of reel base respectively in forward and reverse directions of said tape;

second means for releasing said braking force in second and third operational modes wherein said magnetic tape is fed by rotation of said capstan and pinch roller respectively in said forward and reverse directions at a predetermined second speed slower than said first speed;



said first means including an electromagnetic solenoid excited in the first operational mode and the second operational mode;

said second means associated with said loading means in such a manner as to release said braking force in the second and third operational modes; and

third means including a second link member engageable with said first means, said third means for applying friction onto either one of said pair of reel bases to apply back-tension to said magnetic tape between said capstan disposed downstream of a running direction of said magnetic tape and said one of reel bases rotating in order to supply said magnetic tape in the third operational mode.

4,961,121

AIR BEARING SLIDER RAIL DESIGN WITH TRUMPET-SHAPED RAIL PORTION

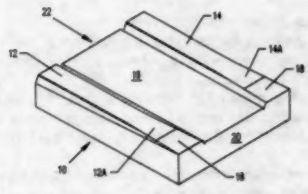
Hans Astheimer, Winterbach; Hans Friedmann, Nierstein, and Hubert Schuy, Main-Drais, all of Fed. Rep. of Germany, assignors to International Business Machines Corporation

Filed Sep. 7, 1988, Ser. No. 241,678

Claims priority, application European Pat. Off., Sep. 22, 1987, 87113907.7

Int. Cl.[5] G11B *5/60, 17/32*

U.S. Cl. 360—103 **6 Claims**



1. An air bearing slider for supporting a transducer comprising:

a slider body having leading and trailing ends, sides, and an air bearing surface;

a pair of substantially coplanar side rails disposed along the sides of said slider body to form a recessed section, open at both the leading and trailing ends of said slider, between said side rails, each of said side rails being defined by first and second edges which are spaced apart to form a coplanar air bearing surface between said edges, said first edge bordering said recessed section and said second edge bordering one of the sides of said slider body, said air bearing surface of each of said side rails having a first portion of constant width extending from the trailing end of said slider to an intermediate point, and a second portion extending from said intermediate point to said leading end of said slider, said second portion of each of said side rails having a contour that is continuously curved in both the first and said second edges with the greatest width at the leading end of the said slider, said intermediate point being near the midpoint between said leading and trailing ends of said slider.

4,961,122

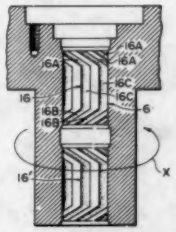
HYDRODYNAMIC GROOVED BEARING DEVICE

Kazuo Sakai, Ibaraki; Takao Terayama, Ushiku, and Juichi Morikawa, Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed May 6, 1987, Ser. No. 46,563

Int. Cl.[5] G11B *5/008*

U.S. Cl. 360—107 **30 Claims**



30. A hydrodynamic grooved bearing device used in an apparatus having a rotary portion with a magnetic head and a fixed portion for supporting said rotary portion on which a magnetic tape is wound so as to effect magnetic recording or reproducing, wherein dynamic pressure generating grooves are formed on one of opposed surfaces of said rotary portion and said fixed portion and fluid is filled between said opposed surfaces of said rotary portion and said fixed portion, each of said dynamic pressure generating grooves being constituted by a pair of slanted groove portions oppositely slanted relative to a direction of relative movement between said rotary portion and said fixed portion such that a distance between said pair of slanted groove portions becomes narrower rearward in the direction of relative movement and a connecting groove portion extending in a direction perpendicular to the direction of relative movement and interconnecting the narrowest ends of said pair of slanted groove portions.

4,961,123

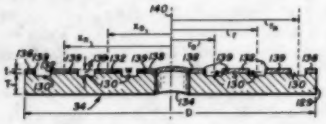
MAGNETIC INFORMATION MEDIA STORAGE WITH OPTICAL SERVO TRACKS

Roger O. Williams, Fremont; Milton C. Kurtz, Saratoga; Jimmy D. Godwin, San Jose; Stephen P. Williams, San Jose, and Gregory K. Roberts, San Jose, all of Calif., assignors to Insite Peripherals, San Jose, Calif.

Filed Jun. 3, 1988, Ser. No. 202,719

Int. Cl.[5] G11B *21/10, 5/012*

U.S. Cl. 360—131 17 Claims



1. An information storage medium comprising:

a magnetic medium for use in a disk drive of a computer; and

a plurality of optical servo tracks positioned on a surface of the magnetic medium and comprising a plurality of equally spaced concentric rings formed as depressed areas in a magnetic layer of the magnetic medium; and

a plurality of magnetic data storage areas that contrast optically with the optical servo tracks and with at least one of said magnetic data storage areas existing between each pair of adjacent optical servo tracks.

4,961,124

MAGNETIC TAPE CASSETTE HAVING A SLIDING CLOSURE MEMBER THAT LOCKS THE WINDING HUBS

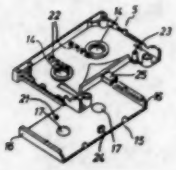
Rudolf Breuer, Munich, and Hubert Brunner, Weil, both of Fed. Rep. of Germany, assignors to AGFA-GEVAERT Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Oct. 11, 1988, Ser. No. 255,613

Claims priority, application Fed. Rep. of Germany, Oct. 22, 1987, 3735671

Int. Cl.[5] G11B *23/02*

U.S. Cl. 360—132 3 Claims



1. A magnetic tape cassette for magnetic tape on tape hubs comprising:

a casing consisting of an upper casing half and a lower casing half containing a pair of winding hubs rotatable therebetween and a slide situated outside of the casing and a magnetic tape wound upon said hubs and having entry openings provided both in said lower casing half and said slide,

toothed rings on an exterior surface of each of said hubs,

side walls on said slide and guides in the lower casing half so constructed and arranged that the slide is movable in a forward and backward motion with relation to the lower casing half,

a spring engaged between said lower casing half and said slide for urging the lower casing half and slide into a closed position of said casing in which the respective entry openings in the casing lower half and slide are non-aligned whereby the slide is movable against the tension of said spring to an open position of said casing in which the respective entry openings are aligned.

a baseplate of said slide arranged adjacent to the lower casing half, said entry openings in said slide being formed in said baseplate.

at least one projecting locking catch on the surface of the baseplate extended toward the lower casing half engaged in a guide groove formed in said lower casing half and said locking catch engageable with the toothed ring of a hub when said slide is in the closed position.

4,961,125

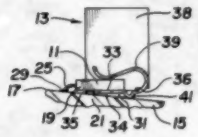
APPARATUS AND METHOD OF ATTACHING AN ELECTRONIC DEVICE PACKAGE AND A HEAT SINK TO A CIRCUIT BOARD

William D. Jordan, Dallas, and Donald L. Clemens, The Colony, both of Tex., assignors to Thermalloy Incorporated, Dallas, Tex.

Filed Aug. 18, 1989, Ser. No. 395,661

Int. Cl.[5] H05K *7/20*

U.S. Cl. 361—383 14 Claims



1. The combination comprising:

(a) a circuit board having a planar surface;

(b) a heat sink comprising:

(i) a base having first and second oppositely disposed major faces and first and second

(ii) heat-dissipating means extending from said base; and

(iii) support means extending from said second major face at a location disposed toward said second end and secured to said planar surface of said circuit board to support said second major face at an acute angle with respect to said planar surface of said circuit board; and

(c) an electronic device package having a planar surface secured adjacent said first major face with leads extending from one end thereof, the distal ends of said leads aligned coplanar with said planar surface of said device package, said leads extending from said first end of said base and secured to said planar surface of said circuit board.

4,961,126

STRUCTURE OF A DEVICE CASING

Hiroyuki Suzuki, Tokyo, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan

Filed Jun. 30, 1989, Ser. No. 375,337

Claims priority, application Japan, Jul. 4, 1988, 63-88876[U]; Apr. 11, 1989, 1-89813; Apr. 14, 1989, 1-43046[U]

Int. Cl.[5] H05K *1/00*

U.S. Cl. 361—398 11 Claims

1. A device casing structure, comprising:

first casing means for carrying a given electronic part, said first casing means having a hinge storing section at one end portion thereof;

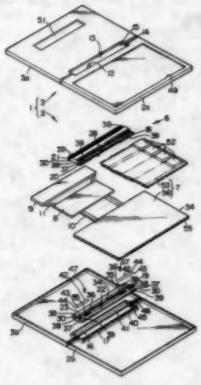
second casing means for carrying a given electronic part, said second casing means having a hinge storing section at one end portion thereof which faces said first casing means;

flexible connection member means for connecting said electronic part carried by said first casing means and said electronic part carried by said second casing means;

hinge member means comprising a pair of hinge portions, at least one of which has a groove for inserting said flexible

connection member means, said hinge member means being arranged within said hinge storing sections of said first and said second casing means, for connecting said first casing means and said second casing means so as to be rotatable relative to each other;

a first support shaft, arranged in said hinge storing section of said first casing means, for rotatably connecting said first casing means and said hinge member means; and



a second support shaft, arranged in said hinge storing section of said second casing means, for rotatably connecting said second casing means and said hinge member means;

wherein said second casing means comprises an upper casing portion and a lower casing portion, and a keyboard is contained between said upper and said lower casing portions.

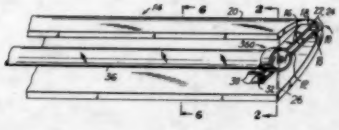
4,961,127

LAMP SOCKET MOUNTING BRACKET

Sylvan R. Shemitz, Woodbridge, and Flemming Brygger, Guilford, both of Conn., assignors to Sylvan R. Shemitz Associates, Inc., West Haven, Conn.

Filed May 9, 1989, Ser. No. 349,582

Int. Cl.[5] F21V *7/00*

U.S. Cl. 362—285 **7 Claims**

1. A device for mounting a lamp socket in a reflector, comprising:

a pair of mounting clamps each having a reflector end and a socket end; wherein:

the reflector has a clamp receiving slot formed therein;

each mounting clamp has a curved portion located intermediate the socket end and reflector end, the curved portion arranged to form, when the mounting clamps are positioned opposite one another, a generally circular recess for receiving a lamp socket with the lamp socket being located in the recess and forming a fulcrum; the device further comprising:

clamp adjusting means located at the socket ends for adjustably connecting the two socket ends of the pair of clamps; wherein:

the fulcrum forms a pivot point to spread apart the feet in the clamp receiving slot as the socket ends are urged together by the clamp adjusting means.

4,961,128

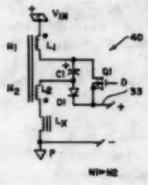
PUSH-PULL ZERO-RIPPLE IM CONVERTER SYSTEM

Gordon E. Bloom, San Rafael, Calif., assignor to Zenith Electronics Corporation, Glenview, Ill.

Filed Dec. 28, 1988, Ser. No. 291,174

Int. Cl.[5] H02M *3/335*

U.S. Cl. 363—16 **13 Claims**



2. A converter circuit, comprising:

(a) first inductor means having one end joined to an input lead and having a core therein;

(b) capacitor means having one end joined at a first node to the other end of said first inductor means;

(c) second inductor means, sharing said core, having one end joined at a second node to the other end of said capacitor means and having its other end joined to a ground reference;

(d) switch means for alternately connecting an output lead to said first node and to said second node; and

(e) operating means for operating said switch means to connect said output lead to said first node for a time period "T1" and to connect said output lead to said second node for a time period "T2", so that an output DC voltage is produced which is a function of the product "VD", where "D" is equal to T1/(T1+T2) and "V" is an input DC voltage.

4,961,129

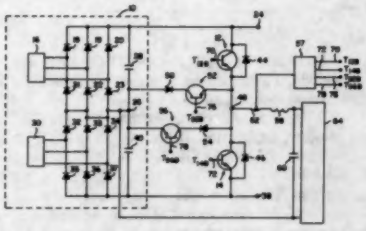
CURRENT CONTROLLED ACTIVE FLYWHEEL TYPE NEUTRAL POINT CLAMPED INVERTER

Sampat S. Shekhawat, Middletown, N.J., assignor to Allied-Signal, Inc., Morris Township, Morris County, N.J.

Filed Dec. 4, 1989, Ser. No. 445,065

Int. Cl.[5] H02M *1/12, 7/521*

U.S. Cl. 363—40 **24 Claims**



1. A power inverter for providing at a load an AC signal having a desired positive voltage during a positive cycle of operation and a desired negative voltage during a negative cycle of operation, comprising:

a DC power source having a positive, a negative and a neutral terminal;

first switching means connected between said positive terminal and an output terminal for positively biasing said

output terminal when said first switching means is selectively enabled to obtain the desired positive voltage in the AC signal;

second switching means connected between said negative terminal and said output terminal for negatively biasing said output terminal when said second switching means is selectively enabled to obtain the desired negative voltage in the AC signal;

third switching means connected between said neutral terminal and said output terminal for providing a current path from said neutral terminal to said output terminal when enabled;

fourth switching means connected between said neutral terminal and said output terminal for providing a current path from said output terminal to said neutral terminal when enabled;

current sensing means connected between said output terminal and the load which can sense a current direction therebetween; and

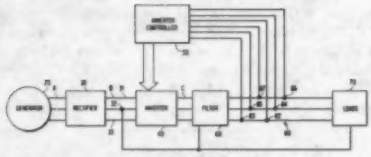
controller means connected to said current sensing means and to said third and fourth switching means for selectively enabling and disabling said third and fourth switching means in accordance with said current direction so as to minimize harmonics of said output.

4,961,130

VOLTAGE INVERTER CONTROL APPLYING REAL-TIME ANGLE PATTERN DETERMINATION

Maurice A. Kirchberg, Jr., Dubuque, Iowa, assignor to Sundstrand Corporation, Rockford, Ill.

Filed Dec. 11, 1989, Ser. No. 448,663
Int. Cl.[5] H02M *1/12*
U.S. Cl. 363—41 **10 Claims**



1. An improved control for a pulse width modulated inverter which takes into account harmonic distortion produced by a d.c. link which is not constant comprising:

a calculator which performs a Fourier transform computation for each output harmonic of interest; and

a detector connected to said calculator and selecting a time for a switching event based on said computation going to zero during an expected time period.

4,961,131

PROGRAMMABLE CONTROLLER

Kazuhide Ashida, Fuchu, Japan, assignor to Kabushiki Kaisha Toshiba, Kanagawa, Japan

Filed Apr. 20, 1988, Ser. No. 183,991
Claims priority, application Japan, Apr. 27, 1987, 62-101739
Int. Cl.[5] G06F *15/46*
U.S. Cl. 364—140 **3 Claims**

1. A programmable controller, comprising:

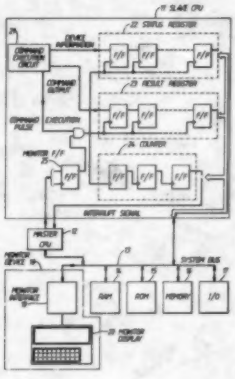
a master CPU for processing data in accordance with a predetermined program including a prescribed sequence of operating steps;

a plurality of operating devices responsive to the master CPU, each having at least two operating states;

a slave CPU, operatively coupled to the master CPU and including command execution circuit means for generating command ouput information in response to the execution of each operating step;

register means, operatively coupled to the command execution circuit means, for storing the command output information and the operating state of selected operating devices;

counting means, operatively coupled to the command execution circuit means and the master CPU, for counting a predetermined number of executed operating steps in the sequence of the program in response to the command



output information from the command execution circuit means, and for providing an output signal to the master CPU upon counting up to the predetermined number of executed operating steps; and

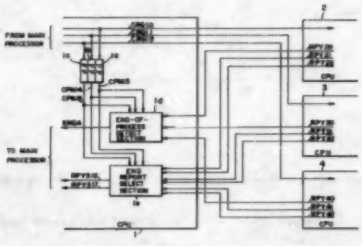
monitor means, responsive to processing performed by the master CPU, for displaying the execution state of the predetermined number of steps.

4,961,132

SYSTEM FOR PROCESSING COMMUNICATIONS AMONG CENTRAL PROCESSING UNITS

Izushi Uehara, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Jan. 29, 1988, Ser. No. 150,276
Claims priority, application Japan, Jan. 29, 1987, 62-17391
Int. Cl.[5] G06F *15/16, 13/00, 9/38*
U.S. Cl. 364—200 **1 Claim**



1. In a communication processing system having a plurality of central processing units (CPUs), including a requesting CPU for requesting service from other CPUs in said plurality, said other CPUs operating concurrently in response to said requests for service said requesting CPU comprising:

storing means for storing information identifying the other CPUs to which said requesting CPU has sent processing requests;

end detecting means for detecting end of processing at all of said other CPUs to which processing requests have been

sent by monitoring end-of-process reports received from said other CPUs while referencing contents of said storing means;

selecting means for selectively combining all of said end-of-process reports from said other CPUs according to the contents of said end-of-process reports from said other CPUs and according to a predetermined priority; and

means for producing a single end report from said selectively combined end-of-process reports when said end detecting means detects end of processing at all of said other CPUs to which processing requests were sent.

4,961,133

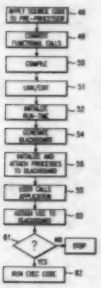
METHOD FOR PROVIDING A VIRTUAL EXECUTION ENVIRONMENT ON A TARGET COMPUTER USING A VIRTUAL SOFTWARE MACHINE

Kiritkumar Talati, Sunnyvale, C. Willard Lackie, Richardson, both of Tex., assignors to VISystems, Inc., Dallas, Tex.

Continuation of Ser. No. 118,307, Nov. 6, 1987, abandoned. This application Aug. 10, 1989, Ser. No. 391,691

Int. Cl.[5] G06F *15/20, 9/44*

U.S. Cl. 364—200 **4 Claims**



1. A method, using a virtual software machine, for providing a virtual execution environment in a target computer for an application software program having one of more execution dependencies that are incompatible with a software execution environment on the target computer, the virtual software machine comprising a plurality of autonomous and independent processes, pre-processing means, a first program means, and a virtual control mechanism having a virtual management interface (VMI) for generating requests for execution to the plurality of independent processes and receiving results of such processing, comprising the steps of:

a) identifying, by the pre-processing means, at least one execution dependency of the application software program and in response thereto using the pre-processing means to generate a pre-processed application software program which isolates the identified execution dependency from the application software program;

b) converting, by a compiler means of the target computer, the pre-processed application software program and the virtual control mechanism into object codes;

c) integrating by a link/edit means of the target computer, the object codes of the pre-processed application software program and the virtual control mechanism is substituted for the identified execution dependency of the application software program;

d) generating, by the first program means, a storage area in the target computer;

e) generating a request for execution when the execution dependency is encountered as the executable code is running in the target computer;

f) evaluating the request for execution to identify which of the plurality of independent processes is required to execute the request for execution;

g) delivering the request for execution via the storage area to the identified independent process;

h) processing the request for execution using the identified independent process to thereby execute the request; and

i) returning results of the executed request back to the virtual management interface of the virtual control mechanism such that the application software program is executed despite the execution dependency that is incompatible with the target computer software execution environment.

4,961,134

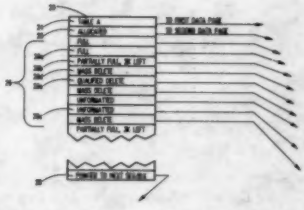
METHOD FOR MINIMIZING LOCKING AND READING IN A SEGMENTED STORAGE SPACE

Richard A. Crus, San Jose; Donald J. Haderle, Los Gatos, and James Z. Teng, San Jose, all of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jul. 15, 1988, Ser. No. 219,514

Int. Cl.[5] G06F *12/00*

U.S. Cl. 364—200 **6 Claims**



1. In a physical storage space managed by a computerized database management system including at least one data storage device, the storage space consisting of two or more pages, a method for accessing those pages comprising the steps of:

(a) storing by the data storage device on any page data for no more than a single entity;

(b) storing by the data storage device separately from each page an indication of the status of that page;

(c) determining the status of a selected one of the pages based on the status indication thereof; and

(d) if the selected page's status is such that the selected page contains only obsolete data because of a deletion of all of the data of the data entity stored on the selected page, accessing the selected page as if the selected page contains no data.

4,961,135

TRANSLATION LOOKASIDE BUFFER CONTROL SYSTEM

Ikuo Uchihori, Fuchu, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Dec. 23, 1987, Ser. No. 137,082

Claims priority, application Japan, Dec. 24, 1986, 306316/86

Int. Cl.[5] G06F *12/08*

U.S. Cl. 364—200 **14 Claims**

1. A translation lookaside buffer control system in a computer using a virtual memory control system, comprising:

virtual address storing means for storing a virtual address;

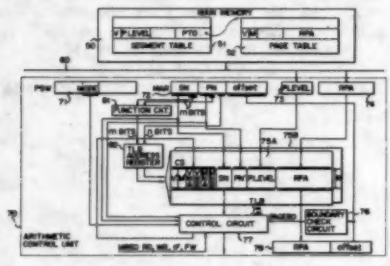
arithmetic operation means, coupled to said virtual address storing means, for receiving contents of predetermined first and second fields of the virtual address, which do not overlap each other in said virtual address storing means and for performing a predetermined operation with respect to the received contents;

TLB address storing means, coupled to said arithmetic operation means and said virtual address storing means, for

storing linked data including contents of a third field, which does not overlap the first and second fields in said virtual address storing means and output data from said arithmetic operation means;

translation lookaside buffer means, coupled to said TLB address storing means, adapted to be addressed by contents of said TLB address storing means, and adapted to store address translation data in each entry including pairs of a virtual address and a physical address, for translating a virtual address into a physical address in each entry;

control means, coupled to said virtual address storing means and said translation lookaside buffer means, for determining whether a virtual address specified by the address translation data stored in the entry of said translation lookaside buffer means designated by the contents of said TLB address storing means coincides with the virtual



address stored in said virtual address storing means and for replacing the address translation data in a corresponding entry of said translation lookaside buffer means when the virtual address does not coincide; and

main memory means, coupled to said control means, for storing data for translating virtual addresses to physical addresses,

wherein said control means includes means for obtaining the address translation data for translating the virtual address stored in said virtual address storing means to a physical address in accordance with the data stored in said main memory means and means for storing the obtained address translation data in an entry of said translation lookaside buffer means, said entry of said translation lookaside buffer means being designated by the contents of said TLB address storing means, when said control means determines that the addresses do not coincide.

4,961,136

MICROPROCESSOR SYSTEM HAVING CACHE DIRECTORY AND CACHE MEMORY AND HARDWARE FOR INITIALIZING THE DIRECTORY

Kazuyuki Sato, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 114,010, Oct. 29, 1987, abandoned. This application Dec. 4, 1989, Ser. No. 443,842

Claims priority, application Japan, Nov. 6, 1986, 61-264402

Int. Cl.[5] G06F *9/445, 12/00*

U.S. Cl. 364—200 **14 Claims**

1. A microprocessor system having a cache directory and a cache memory, comprising:

initializing means for generating a reset signal, in response to an input reset instruction;

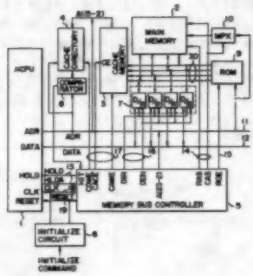
an address bus coupled to an address input of said cache directory;

a microprocessor, coupled to said address bus and reset in response to said reset signal output from said initializing means, for generating a bus acquisition acknowledge signal in response to a bus acquisition request signal applied thereto, said microprocessor releasing said address bus and holding an operation state upon generating said bus acquisition acknowledge signal;

request generating means for outputting said bus acquisition request signal to said microprocessor, in response to said reset signal output from said initializing means, before said reset signal becomes inactive;

write control signal generating means, coupled to receive said bus acquisition acknowledge signal, for sequentially generating write control signals while said bus acquisition acknowledge signal is active, in accordance with said bus acquisition request signal; and

address generating means for sequentially outputting addresses, in accordance with said write control signals,



until said address becomes a predetermined address, each of said addresses including a first address portion and a second address portion, said address generating means being coupled to output said first and second address portions onto said address bus, said write control signal being applied to said cache directory to control an operation of writing said first address portion as predetermined directory data in said cache directory at a directory address designated by said second address portion and thereby initializing said cache directory, said outputted address being updated by a predetermined value every time said address is output to said cache directory, before a next write control signal is generated.

4,961,137

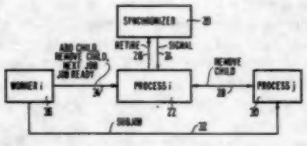
METHOD FOR OPERATING A MULTIPROCESSOR SYSTEM FOR THEREIN ESTABLISHING A GLOBAL BINARY ASSERTION AND A MULTIPROCESSOR APPARATUS COMPRISING SYNCHRONIZATION MEANS FOR SUCH ESTABLISHING, IN PARTICULAR FOR EFFECTING A GARBAGE COLLECTION OPERATION

Alexander Augusteijn, and Fransiscus P. M. Hopmans, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, N.Y.

Filed Apr. 17, 1987, Ser. No. 40,007

Int. Cl.[5] G06F *1/00*

U.S. Cl. 364—200 **14 Claims**



1. A method for operating a multiprocessor data processing

system, which system includes synchronization means for executing a process comprising the following steps:

a. assigning to each processor at least one object, each object having a respective state variable which has three possible values:
active, disquiet
passive, quiet
passive, disquiet, and active, disquiet being an initial state,

b. governing all objects in the system according to the following rules:
i. any object, the value of whose respective state variable includes disquiet, is allowed to cause any other object to cause the value of the respective state variable of that other object to include disquiet;
ii. any object, the value of whose respective state variable includes quiet, is not allowed to cause any other object to cause the value of the respective state variable of that other object to include disquiet;
iii. in any object (referred to hereinafter as a "father object"), that has caused another object to cause the value of the state variable of that other object (referred to hereinafter as a "child object") to include disquiet, the respective state variable retains its current value at least as long as the value of the respective state variable of the child object includes disquiet; and
iv. any object, which is not a father object, is allowed to cause its own respective state variable to assume said passive, quiet value while signalling same to another object that is a father object,
whereby a rigid hierarchy between all objects is not needed;

c. assigning to each object (**22**) a respective local process (**36**) that handles all interactions with other such objects (**30**);

d. assigning a global synchronizer process (**20**) for determining when all objects (**22, 30**) have respective state variables which have at least once had the passive, quiet value;

e. causing all state variables to have the value active, disquiet;

f. executing said objects;

g. sending to said global synchronizer process a retirement signal from each respective object when the respective state variables assume the values passive, quiet for the first time; and

h. in said global synchronizer process, determining when the number of said retirement signals becomes equal to the number of said objects, the respective state variables of all objects then having the value passive, quiet, thereby creating a global assertion.

4,961,138

SYSTEM AND APPARATUS FOR PROVIDING THREE DIMENSIONS OF INPUT INTO A HOST PROCESSOR

Andrew M. Gorniak, Oxford, Conn., assignor to General Data-Comm, Inc., Middlebury, Conn.

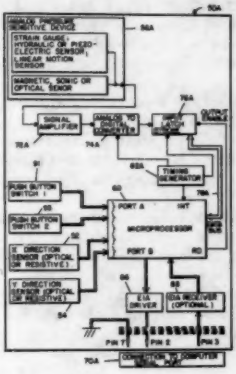
Continuation of Ser. No. 44,969, May 1, 1987. This application Oct. 2, 1989, Ser. No. 418,694
Int. Cl.[5] G06F *3/03*
U.S. Cl. 364—200 **16 Claims**

1. A pressure sensitive computer mouse operable along a substantially planar surface for providing three dimensions of input to a host processor coupled to said mouse, wherein three dimensions of analog input to said mouse are under hand control of a user of said mouse, said mouse comprising:

(a) means for detecting and measuring movement of said mouse in two perpendicular dimensions along said substantially planar surface for providing at least a first output representative of said movement of said mouse in two perpendicular dimensions;

(b) pressure sensitive means for detecting and measuring an analog third dimensional input into said mouse under the hand control of the user while said mouse is located along said planar surface, and for providing a second output representative of said third dimensional input to said mouse, wherein said analog third dimensional input is a force applied by the user to said mouse which is perpendicular to said two perpendicular dimensions; and

(c) electrical interface means at which said first and second outputs representative of said three dimensions of input to said mouse are provided, wherein



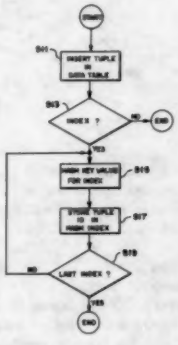
said pressure sensitive means comprises a pressure roller in direct contact with said planar surface and a strain gauge rigidly mounted adjacently atop said pressure roller, and said pressure sensitive means is arranged such that upon an application of said force to said pressure roller, there is substantially no relative movement between said pressure roller and said strain gauge.

4,961,139

DATA BASE MANAGEMENT SYSTEM FOR REAL-TIME APPLICATIONS

Le Thieu Hong, Fremont; Cynthia Givens; Ching Chao Liu, both of Sunnyvale; Michael J. Wright, Los Gatos, and Feyzi Fatehi, Sunnyvale, all of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Jun. 30, 1988, Ser. No. 213,578
Int. Cl.[5] G06F *15/40, 12/00*
U.S. Cl. 364—200 **3 Claims**



3. A method for storing and retrieving data tuples in data tables in a database so that more than one index can be defined for a data table, each location in the data table associated with

a unique tuple identifier, the method for storing comprising the steps of:

(a) defining at least one index on a data table by specifying the entries of the data table that comprise the key value for the index;

(b) inserting a data tuple to be stored in an available location in the data table;

(c) applying a hashing function to the key value for the index, to determine a hash index tuple number corresponding to a location in a hash index table; and

(d) storing the first tuple identifier in the hash index table location corresponding to the determined hash index tuple number;

(e) repeating steps b. through d. above for each index defined on the data table; and

(f) outputting the tuple identifier corresponding to the location in the data table where the data tuple was stored; and the method for retrieving data tuples comprising the steps of:

(a) applying a hashing function to the key value to determine a tuple identifier for a location in a hash index table;

(b) retrieving the tuple identifier from the location in the hash index table; and

(c) retrieving the data tuple from the location in the data table associated with the tuple identifier retrieved from the hash table.

4,961,140

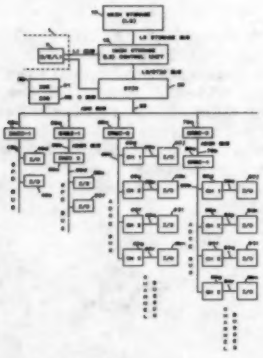
APPARATUS AND METHOD FOR EXTENDING A PARALLEL SYNCHRONOUS DATA AND MESSAGE BUS

Gerald G. Pechanek; David J. Shippy, both of Endwell; Mark C. Saedaker, Vestal, and Sandra S. Woodward, Endwell, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 29, 1988, Ser. No. 212,784

Int. Cl.[5] G06F *13/36, 13/42, 13/00*

U.S. Cl. 364—200 **13 Claims**



1. In a data communication bus system for transferring information between a central processing unit, a storage unit and input/output units, including an arbitration unit for selecting one of a plurality of units contending for access to said bus system, comprising:

a. a plurality of data lines;

b. a plurality of control lines;

c. a first of said control lines adapted to carry a busy signal;

d. control signal means associated with said units for placing signals on said control lines to control operation of said units including a busy signal which is generated upon transfer of a block of information;

e. said control signal means including means for terminating said busy signal on a first one of said plurality of control lines prior to the termination of data signals on said data lines; and,

f. means within said arbitration unit for inhibiting the selection of one of a plurality of contending units when said busy signal is present and permitting the selection of one of a plurality of contending units when said busy signal is absent whereby the arbitration sequence is performed during the completion of said transfer of said block of information.

4,961,141

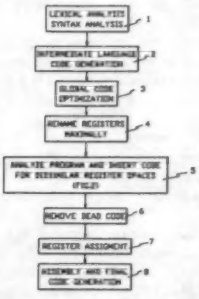
GENERATING EFFICIENT CODE FOR A COMPUTER WITH DISSIMILAR REGISTER SPACES

Martin E. Hopkins, Chappaqua, and Henry S. Warren, Jr., Ossining, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 16, 1988, Ser. No. 285,459

Int. Cl.[5] G06F *9/45*

U.S. Cl. 364—200 **11 Claims**



1. In a compiler which generates compiled object code from source code of a computer program, a computer performed method of generating efficient object code for a computer with dissimilar register spaces comprising the steps of:

generating by a computer code that references symbolic registers in which a register class is not distinguished;

making entries in a table by the computer denoting a context in which each symbolic register occurs and constructing an equivalence tree of symbolic registers for move instructions assigned to a same equivalence class;

for each equivalence class, forming by the computer a logical OR function of register usage information for all symbolic registers in the equivalence class, and for each symbolic register that appears in more than one register space context, generating by the computer new symbolic register numbers so that there is one number for each register space, and storing the new symbolic register numbers in said table; and

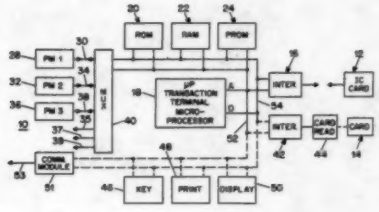
if a definition point of a symbolic register is encountered and that symbolic register is used in more than one register space context, inserting by the computer code in said program to either do a same operation as is done at the definition point in each register space or move a value in the symbolic register from one space to another.

4,961,142

MULTI-ISSUER TRANSACTION DEVICE WITH INDIVIDUAL IDENTIFICATION VERIFICATION PLUG-IN APPLICATION MODULES FOR EACH ISSUER

John C. Elliott, Summit; James A. O'Connell, Short Hills, both of N.J.; Lawrence Ladouceur, Scarsdale, N.Y.; William Altman, Lower Paxton, Pa., and Keith Jarett, Oakland, Calif., assignors to MasterCard International, Inc., New York, N.Y.

Filed Jun. 29, 1988, Ser. No. 212,892
Int. Cl.[5] G07F 19/00; H04L 9/00; G06F 15/30
U.S. Cl. 364—408 13 Claims



1. An electronic transaction device for performing transactions with any one of a plurality of diverse personal transaction identification devices, said identification devices including stored identification data and adapted to be used for diverse transaction function, said plurality including at least one personal identification device having a device microprocessor and a device program for use in transactions, comprising:

first interface means for receiving any of said personal transaction identification devices for generating first data signals corresponding to said stored identification data;

second interface means, including a plurality of receiving portions, for simultaneously receiving a plurality of program modules, and for generating second data signals corresponding to data stored on said program modules;

at least one program module connected to one of said receiving portions of said second interface means and including a module microprocessor, a module program for operating said module microprocessor, and a transaction program for carrying out portions of said transactions with said microprocessor containing personal identification device;

and a first data processing means, coupled to operate and receive data signals from said first and second interface means and including a control program responsive to said first data signals for selecting a program module, and for executing said transaction program.

11. A program module for use in a transaction terminal of the type accepting personal transaction identification devices, wherein said devices include stored identification data, and wherein said transaction terminal includes a first interface means for receiving said personal transaction identification devices for generating first data signals corresponding to the stored identification data; a second interface means with at least two terminal connector means for detachably receiving program modules, said second interface means for generating second data signals corresponding to data stored in said program modules; and processor means within said transaction terminal for receiving data signals from said first and second interface means and including a control program responsive to said first data signals for selecting a program module; said program module comprising:

a module microprocessor;

module connector means for connecting said module microprocessor to said terminal connector means for communication with the terminal processor means;

a module program for operating said module microprocessor; and

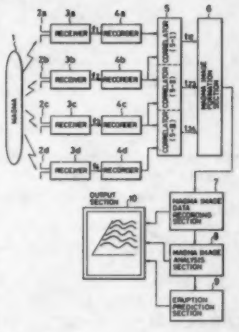
a transaction program executed by said terminal processor means for carrying out transactions with said personal transaction identification devices.

4,961,143

METHOD OF PREDICTING VOLCANIC ERUPTIONS

Kozo Takahashi, Higashi-Kurume, and Yukio Fujinawa, Tsuchiura, both of Japan, assignors to Communications Research Laboratory, Ministry of Posts & Telecommunications, Tokyo and National Research Institute for Earth Science & Disaster Prevention, Science & Technology Agency, Tsukuba, both of, Japan

Filed Mar. 7, 1989, Ser. No. 319,721
Claims priority, application Japan, Mar. 24, 1988, 63-68203
Int. Cl.[5] G01V 3/12
U.S. Cl. 364—421 4 Claims



1. A method of predicting volcanic eruptions comprising the steps of simultaneously receiving long-wave radiation signals from magma at at least four points in the vicinity of the magma, cross-correlating the received signals to detect time lags among the signals, calculating the site, magnitude and shape of the magma from the time lags, and predicting the likelihood of a volcanic eruption from time-course changes in the calculated site, magnitude and shape of the magma.

4,961,144

SELF-CHECK METHOD OF FOUR-WHEEL STEERING DRIVE SYSTEM

Hideo Yabe, and Hideo Hori, both of Saitama, Japan, assignors to Jidosha Kiki Co., Ltd., Tokyo, Japan

Filed May 11, 1989, Ser. No. 350,291
Claims priority, application Japan, May 18, 1988, 63-119221
Int. Cl.[5] B62D 5/00
U.S. Cl. 364—424.05 6 Claims

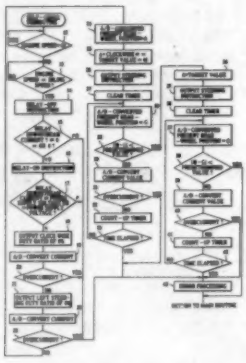
1. A self-check method of a four-wheel steering drive system for a vehicle, which comprises a rear-wheel steering mechanism for steering rear wheels, a steering motor for driving said rear-wheel steering mechanism, an H bridge circuit, consisting of four switching elements, for driving said steering motor in a forward or reverse direction to turn said rear wheels to the left or right, and a relay for turning on/off a battery power supply with respect to said H bridge circuit, comprising the steps of, when an engine of the vehicle is in an idling state before starting traveling:

(1) checking a relay downstream current upon ON/OFF of said relay to check a state of said relay;

(2) supplying forward and reverse rotation control signals of a duty ratio of 0% to a predetermined combination of said switching elements constituting said H bridge circuit to check if a current obtained from said predetermined combination of switching elements is an overcurrent, thereby checking a state of said H bridge circuit; and

(3) when the rear wheels are turned to a target rear wheel

position with reference to a present rear-wheel position, checking whether or not a difference between the target rear-wheel position and an actual rear-wheel position is set



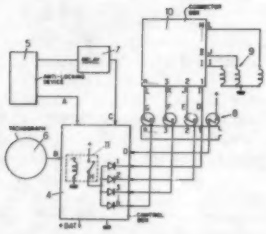
to be not more than a predetermined value within a predetermined period of time, thereby checking a state of said steering motor and said rear-wheel steering mechanism.

4,961,145

VEHICLE BRAKE SYSTEM WITH ANTI-LOCKING DEVICE FOR THE WHEELS AND RETARDER WITH MONITORED ACTUATION

Philippe Gernot, Puteaux, France, assignor to Labiavia - S.G.E., France

Filed Jan. 19, 1989, Ser. No. 298,996
Claims priority, application France, Jan. 22, 1988, 88 00715
Int. Cl.[5] B60T *8/00*
U.S. Cl. 364—426.02 **16 Claims**



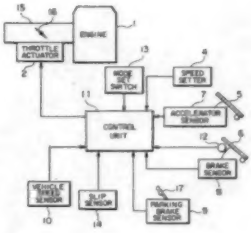
1. A vehicle brake system including an anti-locking device for the wheels of the vehicle and a retarder for, when actuated, slowing down the vehicle, said system further comprising means for prohibiting actuation of the retarder at least from the moment that a regulation request is transmitted to said anti-locking device, and means for re-starting the retarder and for providing re-enabling of said re-starting only from the moment that a new braking request is transmitted, said system further including a braking circuit including a bank of pressure switches incorporated therein and control means for providing that a braking related signal is picked up by a first switch of said bank of switches so as to enable the restarting of said retarder and that signals supplied by other pressure switches of said bank of switches are used for triggering actuation of various positions of operation of the retarder.

4,961,146

AUTOMOBILE SPEED CONTROL APPARATUS WITH CREEP CONTROL

Yasuya Kajiwara, Himeji, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 1, 1989, Ser. No. 430,047
Claims priority, application Japan, Nov. 8, 1988, 63-283012; Nov. 8, 1988, 63-283013
Int. Cl.[5] B60K *31/00*
U.S. Cl. 364—426.04 **5 Claims**



1. A speed control apparatus for an automotive vehicle comprising:

a throttle valve actuator for opening and closing a throttle valve of the vehicle;

a brake pedal depression sensor for sensing the amount of depression of a brake pedal of the vehicle;

a vehicle speed sensor for sensing the speed of the vehicle; and

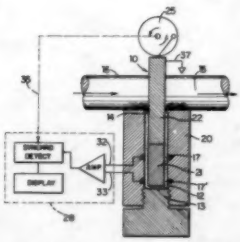
slow speed creep control means responsive to the brake pedal depression sensor and the vehicle speed sensor for controlling the throttle valve actuator to adjust the throttle valve opening in accordance with the sensed amount of depression of the brake pedal and the sensed vehicle speed only when the vehicle speed is below a predetermined, creep control enabling level.

4,961,147

APPARATUS FOR MEASURING THE ELECTRIC CHARGE CONDITION OF NON-CONDUCTIVE PARTICLES IN A LIQUID MEDIUM

Zack J. Moore, 519 Oak Dr., Lake Jackson, Tex. 77566

Filed Sep. 28, 1989, Ser. No. 413,635
Int. Cl.[5] G01N *27/60*
U.S. Cl. 324—446 **6 Claims**



1. An apparatus for sensing and quantifying the electrical charge condition in a flowable liquid media containing electrical charge influencing species comprising a flow path member, said flow path member having electrically insulating walls, an open end and a closed end, said flow path being so disposed that it may be substantially filled with said liquid, a reciprocating member carrying a grounded electrode disposed within

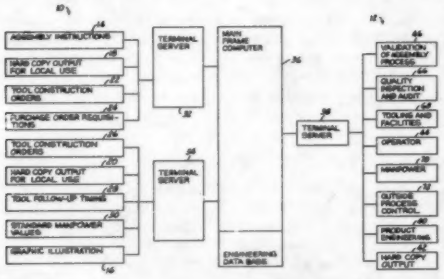
said flow path member for mechanically inducing the ions in said liquid to flow in more than one direction, said reciprocating member having a transverse cross-sectional configuration such that said reciprocating member fits adjacent but spaced from said electrically insulating walls of said flow path member, means for admitting predetermined amounts of flowable material to said flow path member, sensory means in said flow path member for developing a signal proportional to a desired ion activity, and means coupled to said sensory means for amplifying any electrical signal induced across said sensory means.

4,961,148

METHOD FOR PREPARING AUTOMOTIVE ASSEMBLY OPERATIONS DOCUMENTS

Steven F. Holda, Milford; Francis E. Plonka, Grosse Pointe; Daniel J. VandenBrossche, New Baltimore, and John S. Felice, Rochester, all of Mich., assignors to Chrysler Corporation, Highland Park, Mich.

Filed Feb. 6, 1989, Ser. No. 306,720
Int. Cl.[5] G06F *15/46*
U.S. Cl. 364—468 **2 Claims**



1. A method for preparing documents that enable execution of discrete automotive assembly operations at a central production engineering location and electronically transmitting the documents to a remote user location comprising the steps of:

a. providing first data terminal means at the central production engineering location for entry of assembly instruction data, graphic illustrations data, and related data;

b. entering such data into the first data terminal means to create documents that enable execution of discrete automotive assembly operations;

c. communicating the input data from the first data terminal means to a central computer;

d. processing the input data at the central computer into a format which can be printed or displayed on electronic display device monitors and which includes the information needed to enable execution of discrete automotive assembly operation;

e. communicating the thus formatted data to a remote user location;

f. providing second data terminal means at the remote user location;

g. receiving the formatted data by means of the second data terminal means and reviewing it for operability and verification of vehicle design intent;

h. entering any needed change data into the second terminal means;

i. communicating the change data from the second data terminal means to the central computer;

j. processing the change data at the central computer for transmission to the first data terminal means for consideration at the central production engineering location;

k. receiving and reviewing the change data by means of the first data terminal means and making any needed changes in accordance with steps b, c, d and e; and

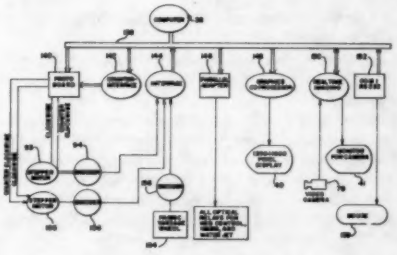
l. using the documents at the remote location to enable execution of discrete automotive operations.

4,961,149

METHOD AND APPARATUS FOR MARKING AND CUTTING A FLEXIBLE WEB

Bruce H. Schneider, Fort Calhoun; Jerry S. Schneider, Omaha, both of Nebr., and Mark E. Smith, Council Bluffs, Iowa, assignors to Intellitek, Inc., Counsel Bluffs, Iowa

Filed Jan. 27, 1989, Ser. No. 303,470
Int. Cl.[5] G06F *15/46*
U.S. Cl. 364—469 **24 Claims**



1. Apparatus for use in cutting and marking a web of fabric for use in making an item of upholstered furniture or the like, said fabric having at least one distinct visible design feature and a predetermined repeat length, comprising:

means for holding a length of said fabric between two stations on a work area such that the length is in a generally planar orientation;

means for scanning said fabric to identify at least one predominate visible design feature of at least two repeat lengths and storing the locations of each identified design feature in a memory means;

means for comparing the locations of stored design features of one or more adjacent stored design features to determine the presence and absence of dimensional distortion of the web;

means for determining a layout on the web of fabric, the layout comprising a number of pieces of fabric of predetermined shapes and sizes that are to comprise the pieces of fabric for the item of furniture to be made;

means for selectively adjusting the predetermined shapes and sizes of predetermined ones of the pieces of fabric to compensate for the presence of dimensional distortion of the web so that the resulting item of furniture to be made will have no visible fabric distortion and the fabric will snugly cover and fit on the item of furniture;

means for selectively cutting said web of fabric into pieces of said predetermined shapes and sizes, said cutting means being moveable about said work area; and,

means for selectively marking said fabric to identify future cut lines and to identify pieces of fabric, said marking means being moveable about said work area.

4,961,150
CURVE GENERATING METHOD USING TANGENT VECTORS

Masaki Seki; Koji Samukawa, and Osamu Hanaoka, all of Tokyo, Japan, assignors to Fanuc Ltd., Yamanashi, Japan

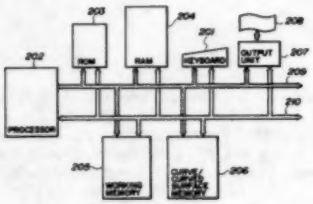
PCT No. PCT/JP87/00628, § 371 Date May 2, 1988, § 102(e) Date May 2, 1988, PCT Pub. No. WO88/02153, PCT Pub. Date Mar. 24, 1988

PCT Filed Aug. 26, 1987, Ser. No. 199,044

Claims priority, application Japan, Sep. 10, 1986, 61-211395

Int. Cl.[5] G05B *19/403*

U.S. Cl. 364—474.29 **5 Claims**



1. A method of machining a three-dimensional curved surface comprising the steps of:

(a) detecting a circular arc passing through three discretely given consecutive points P_{i-1}, P_i, P_{i+1} of the curved surface;

(b) determining a tangent vector of a tangent line contacting said circular arc at the central point Pi of said three points;

(c) determining a curve smoothly connecting the two points P_{i-1}, P_i by performing a spline interpolation between the two points P_{i-1}, P_i using position vectors P_{i-1}, P_i at the points P_{i-1}, P_i and tangent vectors T_{i-1}, T_i at the points P_{i-1}, P_i determined in step (b);

(d) determining a point sequence connecting curve by performing a spline interpolation between every two adjacent consecutive points; and

machining the three-dimensional curved surface according to the point sequence connecting curve.

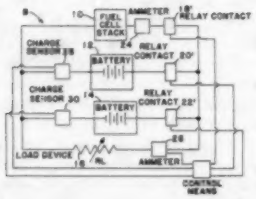
4,961,151
FUEL CELL/BATTERY CONTROL SYSTEM

Jack Early, Perth Amboy, and John Werth, Princeton, both of N.J., assignors to Engelhard Corporation, Edison, N.J.

Continuation of Ser. No. 161,355, Feb. 22, 1988, abandoned, which is a continuation of Ser. No. 48,995, May 7, 1987, abandoned, which is a continuation of Ser. No. 896,302, Aug. 12, 1986, abandoned, which is a continuation of Ser. No. 537,461, Sep. 29, 1983, abandoned. This application Jan. 11, 1989, Ser. No. 296,283

Int. Cl.[5] B60K *1/00;* **G06F** *15/20*

U.S. Cl. 364—492 **6 Claims**



1. A hybrid source system for supplying electrical current to a load and for controlling the amount of current supplied in response to current demand from the load comprising:

a primary electrical power source couplable to the load through a first switch means associated therewith and having a predetermined maximum desired power output;

energy storage means having a predetermined desired minimum and maximum level of charge, said energy storage means being couplable to the load in parallel with the primary electrical power source through a second switch means associated therewith; either said primary electrical energy source or said energy storage means or combinations thereof being connected to the load in parallel to supply current to the load depending upon whether said first or said second switch means or a combination thereof are appropriately energized;

first current sensing means for sensing the current flowing into the load;

second current sensing means for sensing the current flowing from the primary energy source;

charge sensor means for sensing the state of charge in said energy storage means; and

control means responsive to said first current sensing means, said second current sensing means and said charge sensor means for selectively energizing either said first or said second switch means in a manner such that the current demand on said primary electrical energy source is maintained at or below approximately its predetermined maximum desired power output level and said energy storage means is maintained at a charge level between said minimum and maximum level of charge.

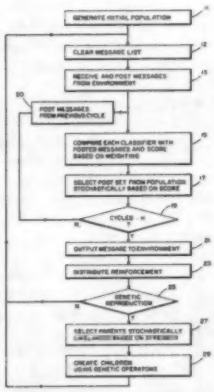
4,961,152
ADAPTIVE COMPUTING SYSTEM

Lawrence Davis, Cambridge, Mass., assignor to Bolt Beranek and Newman Inc., Cambridge, Mass.

Filed Jun. 10, 1988, Ser. No. 205,154

Int. Cl.[5] G06F *15/18;* **G05B** *13/00*

U.S. Cl. 364—513 **10 Claims**


GENERATE INITIAL POPULATION
CLEAR MESSAGE LIST
RECEIVE AND POST MESSAGES FROM ENVIRONMENT
POST MESSAGES FROM PREVIOUS CYCLE
COMPARE EACH CLASSIFIER WITH POSTED MESSAGES AND SCORE BASED ON MATCHING
SELECT POST SET FROM POPULATION STOCHASTICALLY BASED ON SCORE
CYCLES = n
OUTPUT MESSAGE TO ENVIRONMENT
DISTRIBUTE REINFORCEMENT
GENETIC REPRODUCTION
SELECT PARENTS STOCHASTICALLY
CREATE CHILDREN USING GENETIC OPERATORS

6. A method of generating responses to a source of a binary encoded input signal comprising a successive of messages, said source providing a reinforcement signal for good responses, said method comprising:

initially generating a population of classifiers, each classifier comprising;

a binary encoded match string of bits;

for each bit in the match string, a weighting value;

a binary encoded response message definer; and

a strength value for the classifier;

for successive input signal messages performing the steps of:

comparing the match string of each classifier to each successive input signal message provided by the source

and generating a corresponding score value which is a function of the weighting values of the matching bits;

comparing the score values generated by the different classifiers;

outputting respective response messages for classifiers selected stochasically on a basis favoring those classifiers having the better scores;

modifying, as a function of a received reinforcement signal, the strength values for classifiers whose response messages were appropriate; and

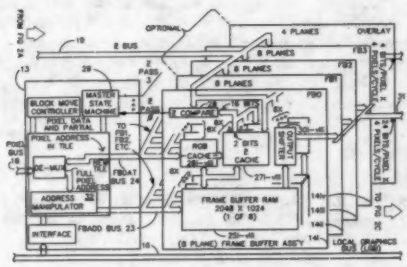
periodically applying genetic operations to generate new classifiers based upon the modification of selected ones of said match strings and selected sets of weighting values, the selection process including a randomizing component and a component based on the respective strength values of the classifiers.

4,961,153

GRAPHICS FRAME BUFFER WITH STRIP Z BUFFERING AND PROGRAMMABLE Z BUFFER LOCATION

Robert W. Fredrickson, and Andrew C. Goris, both of Ft. Collins, Colo., assignors to Hewlett Packard Company, Palo Alto, Calif.

Filed Aug. 18, 1987, Ser. No. 86,350
Int. Cl.[5] G06F *3/14*
U.S. Cl. 364—521 **2 Claims**



1. A computer graphics display system with Z buffering and hidden surface removal comprising:

a frame buffer having an address space;

means coupled to the frame buffer for storing pixel intensity values into the frame buffer at a first portion of the address space;

Z buffer mapping means for mapping pixel addresses of pixels having pixel depth values into a selected portion of the remaining address space of the frame buffer;

means responsive to the Z buffer mapping means and coupled to the frame buffer, for storing pixel depth values into the selected portion of the remaining address space of the frame buffer; and

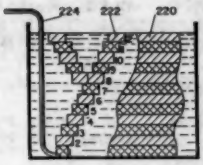
graphics display means, coupled to the frame buffer, for sequentially and repeatedly addressing the first portion of the frame buffer, reading the pixel intensity values stored thereat, and producing corresponding pixel intensities at physical pixel locations in one-to-one correspondence with the addresses within the first portion.

4,961,154

THREE DIMENSIONAL MODELLING APPARATUS

Itzchak Pomerantz, Kefar Sava; Joseph Cohen-Sabban, Yahud; Avigdor Bieber, Raanana; Josef Kamir, Netanya; Mathew Katz, Haifa, and Michael Nagler, Tel Aviv, all of Israel, assignors to Scitex Corporation Ltd., Herzlia Bet., Israel

Filed Jun. 2, 1987, Ser. No. 57,366
Claims priority, application Israel, Jun. 3, 1986, 79007; Nov. 23, 1986, 80728; May 14, 1987, 82536
Int. Cl.[5] G06F *15/20*
U.S. Cl. 364—522 **25 Claims**



25. A system responsive to coordinate information with respect to a three-dimensional element for automatically providing a three-dimensional model of said three-dimensional element comprising:

means for sequentially irradiating a plurality of layers of a first material which is solidifiable in response to such irradiation in accordance with said information; and

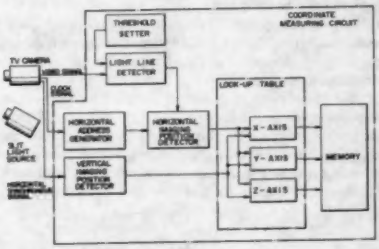
means for adding to each layer of said first material, subsequent to irradiation thereof, a second solidifiable material, which is not solidifiable in response to such irradiation, to serve as a support material, prior to irradiation of a subsequent layer of said first material.

4,961,155

XYZ COORDINATES MEASURING SYSTEM

Osamu Ozeki; Kazunori Higuchi, and Shin Yamamoto, all of Aichi, Japan, assignors to Kabushiki Kaisha Toyota Chuo Kenkyusho, Aichi, Japan

Filed Sep. 19, 1988, Ser. No. 246,131
Claims priority, application Japan, Sep. 19, 1987, 62-235292; Sep. 19, 1987, 62-235293; Sep. 19, 1987, 62-235294
Int. Cl.[5] G01B *11/00*; G06F *15/46*
U.S. Cl. 364—559 **20 Claims**



1. An XYZ coordinates measuring system comprising:

a slit light source means for projecting a slit light beam onto a surface of a work to be measured with a predetermined angle;

television camera means for taking a light line formed on the surface of the work by said slit light beam to generate an output video signal; and

coordinate measuring circuit means for processing said video signal and for detecting horizontal and vertical imaging positions Ks and Ls of said light line, said coordi-

nate measuring circuit means including look-up table means for previously storing an interrelationship between horizontal and vertical imaging positions of said light line and XYZ coordinates thereof on said surface of the work, thereby outputting XYZ coordinates on the surface of the work from the look-up table means, based on detected values of the horizontal and vertical imaging positions Ks and La,

whereby the XYZ coordinates on the surface of the work are real-time measured along the light line.

4,961,156

SIMULATION CAPABLE OF SIMULTANEOUSLY SIMULATING A LOGIC CIRCUIT MODEL IN RESPONSE TO A PLURALITY OF INPUT LOGIC SIGNALS

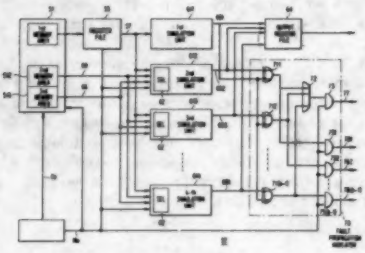
Shigeru Takasaki, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Oct. 27, 1988, Ser. No. 263,217

Claims priority, application Japan, Oct. 27, 1987, 62-269350; Feb. 29, 1988, 63-46103

Int. Cl.[5] G06F *15/20, 7/38*

U.S. Cl. 364—578 **12 Claims**



1. A logic simulator for use in simulating a logic circuit model which is defined by a set of connection information signals representative of connections in said logic circuit model and which is operable in response to first through k-th input data signals to produce an output signal where k represents a natural number greater than unity, said logic simulator comprising:

signal producing means for producing said first through k-th input data signals with said set of connection information signals kept unchanged;

simulation means supplied from said signal producing means with said first through k-th input data signals and said connection information signals, said simulation means for simultaneously carrying out first through k-th simulations of said logic circuit model as defined by said connection information signals to produce first through k-th simulation result signals which are representative of results of said first through k-th simulations, respectively; and

processing means for processing said first through k-th simulation result signals to produce said output signal.

4,961,157

METHOD AND APPARATUS FOR ELECTROSTATIC DISCHARGE TESTING OF MACHINES WHICH REPETITIVELY EXECUTE A STORED PROGRAM WITH A PLURALITY OF PROGRAM STEPS

Howard H. Nick, LaGrangeville; Brock E. Osborn, Hyde Park, and Chang Y. Wu, Wappingers Falls, all of N.Y., assignors to International Business Machines, Armonk, N.Y.

Filed Nov. 28, 1988, Ser. No. 276,733

Int. Cl.[5] H01T *19/00*

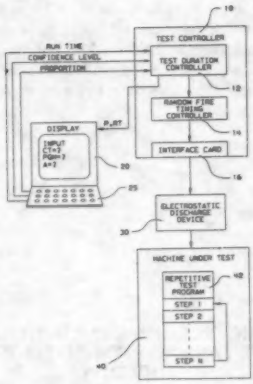
U.S. Cl. 364—579 **19 Claims**

1. An apparatus for conducting an electrostatic discharge test of a machine which repetitively executives a stored program having a plurality of program steps, said apparatus comprising:

electrostatic discharge means for supplying electrostatic discharges to said machine;

random fire timing control means for controlling time intervals between said electrostatic discharges such that said time intervals are random;

test duration control means for controlling the duration of said electrostatic discharge test.



16. A method for conducting an electrostatic discharge test of a machine which is repetitively executing a stored program having a plurality of program steps, said method comprising the step of:

electrostatically exciting said machine at randomly spaced time intervals and for a duration determined through user specified parameters selected from the group consisting of run time duration and confidence level, said confidence level being specified as the probability of at least one discharge occurring during a proportion of said program steps.

4,961,158

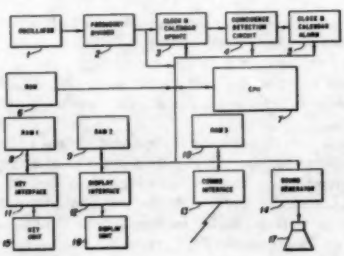
PORTABLE TRANSACTION TRACKING DEVICE

Lester Sussman, 8315 N. Brook La., #401, Bethesda, Md. 20814

Filed Nov. 22, 1988, Ser. No. 274,766

Int. Cl.[5] G06F *3/023, 3/14*

U.S. Cl. 364—709.04 **7 Claims**



1. An electronic hand-held memory device comprising:

input means for introducing alphanumeric data into said device, said alphanumeric data comprising of transaction descriptions, transacted data, label codes each representative of the leading address of a particular transaction

description, said transaction description comprising of transaction unit costs, actual total costs of the said transaction and the quantity of the said transacted items;

memory means responsive to said input means for storing a plurality of transaction description data and transacted data that are logically linked together, but separately stored in said memory by means of said label code;

memory means responsive to said input means for storing a plurality of non-transaction data;

time keeping circuitry means for keeping actual constant time;

output display means to display desired transaction description data and transacted data, accessed by means of said transaction label codes, introduced by said input means;

computing means responsive to said transaction label codes corresponding to desired transaction data to sum together the said transaction numeric data stored in association therewith to form information representative of the sum of said numeric data;

computing means responsive to said transaction label codes corresponding to desired transaction data for multiplying or dividing the said transaction numeric data stored in association therewith to form arithmetic information representative of the arithmetic division or multiplication of the said numeric data by a constant arithmetic value, said constant arithmetic value introduced by said input means;

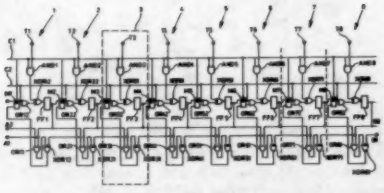
control means to label said transacted data, by said time keeping circuitry means, with a time stamp label, such that said transacted data is uniquely defined within said memory means, by means of combining said time stamp label together with said transaction label code;

interface means for the bi-directional transfer of said transaction description data, said transaction label codes and said transacted data between the said device and an remote electronic device.

4,961,159
CELLULAR AUTOMATON FOR GENERATING RANDOM DATA

Robert McLeod; Howard Card, both of Winnipeg, Canada; Peter Hortensius, Goldens Bridge, N.Y., and Werner Pries, Steinbach, Canada, assignors to University of Manitoba, Manitoba, Canada

Continuation-in-part of Ser. No. 112,118, Oct. 26, 1987, Pat. No. 4,860,236. This application Aug. 11, 1989, Ser. No. 392,637
The portion of the term of this patent subsequent to Aug. 22, 2006, has been disclaimed.
Int. Cl.[5] G06F *1/02*
U.S. Cl. 364—717 **14 Claims**



1. A cellular automation which generates pseudorandom data, comprising:

a series of cells arranged such that each cell receives signals from associated first and second electrically adjacent cells; each particular cell in the series of cells having

(a) a storage unit for electrically storing a data bit having two distinct states, the storage unit having an output terminal where the current state of the data bit is electrically detectable; and

(b) logic circuitry coupling the storage unit of the particular cell to the storage unit of the associated first electrically adjacent cell and to the storage unit of the second electrically adjacent cell, the logic circuitry responding to one of either

(i) the current state of the data bit stored by the particular cell and the data bits stored by the first and second electrically adjacent cells by changing the value of the data bit stored by the particular cell according to the following relationship:

$$a(t+1)=a_{first}(t) \text{ XOR } a(t) \text{ XOR } a_{second}(t),$$

or

(ii) the current state of the data bits stored by the first and second electrically adjacent cells by changing the value of the data bit stored by the particular cell according to the following relationship:

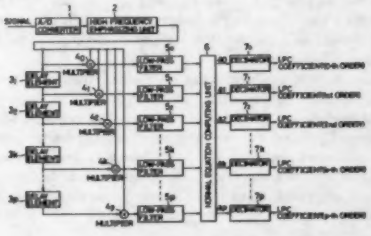
$$a(t+1)=a_{first}(t) \text{ XOR } a_{second}(t),$$

where a(t) represents the current state of the data bit stored by the particular cell, a(t+1) represents the next state of the data bit stored by the particular cell, $a_{first}(t)$ represents the current state of the data bit stored by the first electrically adjacent cell, and $a_{second}(t)$ represents the current state of the data bit stored by the second electrically adjacent cell.

4,961,160
LINEAR PREDICTIVE CODING ANALYSING APPARATUS AND BANDLIMITING CIRCUIT THEREFOR

Shinichi Sato; Atsushi Fukasawa; Takuro Sato; Yasuo Shoji; Haruhiro Shiino; Yukio Suzuki, and Hiromi Ando, all of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed Apr. 27, 1988, Ser. No. 186,576
Claims priority, application Japan, Apr. 30, 1987, 62-104633; May 6, 1987, 62-108816; May 8, 1987, 62-110847
Int. Cl.[5] G06F *15/31*
U.S. Cl. 364—724.01 **2 Claims**



1. An LPC analyser, comprising:

computing means for computing instantaneous covariance functions of a series of signals and for obtaining instantaneous covariance function signals representing said instantaneous covariance functions;

bandlimiting means with a flat delay characteristic within the pass-band for bandlimiting the frequency characteristics of the instantaneous covariance function signals, wherein the bandlimiting means includes filters, decimators for reducing the sampling rate and an interpolator for increasing the sampling rate, the filters and the decimetors being cascaded alternately and the interpolator being cascaded at the last stage;

normal equation computing means for receiving signals output from the bandlimiting means and solving a normal equation; and

sampling means for sampling the result from the normal equation computer means at a frequency which is higher

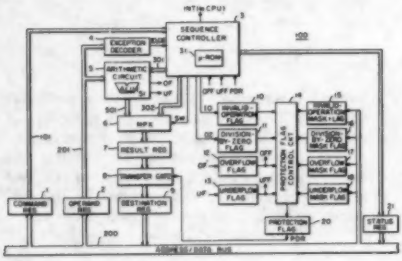
than the Nyquist frequency of the output signals from the bandlimiting means.

4,961,161

ARITHMETIC PROCESSOR PERFORMING MASK AND TRAP OPERATIONS FOR EXCEPTIONS

Shingo Kojima, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Nov. 16, 1988, Ser. No. 271,832
Claims priority, application Japan, Nov. 16, 1987, 62-289912
Int. Cl.[5] G06F 7/00
U.S. Cl. 364—736.5 **7 Claims**



1. A data processor in which an exception may occur during an arithmetic operation, said data processor comprising:

a first flag register which is set in response to occurrence of said exception,

a second flag register storing either one of first and second data, said first data designating a first operation responsive to occurrence of said exception and said second data designating a second operation responsive to occurrence of said exception,

a third flag register,

first means, coupled to said first and second flag registers, for setting said third flag register when said first flag register is set and said second flag register is storing said first data,

a destination register,

second means for producing a default value in response to occurrence of said exception, and

third means, coupled to said destination register and said second means, for writing said default value into said destination register when said third flag register is not set and for inhibiting said default value from being written into said destination register when said third flag register is set.

4,961,162

MULTIPROCESSING SYSTEM FOR PERFORMING FLOATING POINT ARITHMETIC OPERATIONS

Myhong Nguyenphu, and Larry E. Thatcher, both of Austin, Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

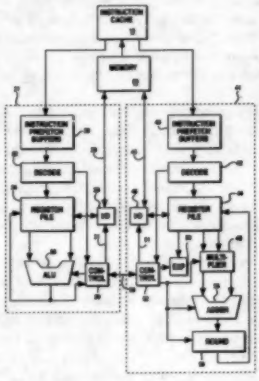
Filed Jan. 13, 1989, Ser. No. 297,782
Int. Cl.[5] G06F 7/38
U.S. Cl. 364—748 **12 Claims**

1. A data processing system comprising:

a fixed point arithmetic processor means for performing fixed point arithmetic operations and including control means for decoding a floating point arithmetic instruction specifying a floating point arithmetic operation, and an addressing means for computing addresses for floating point data for said floating point operation from a memory means;

said memory means for storing data and including means for receiving said addresses from said fixed point arithmetic processor means and providing said floating point data to a floating point arithmetic processor means; and

said floating point arithmetic processor means for performing floating point arithmetic operations and including



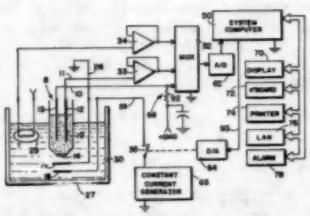
control means for decoding the floating point instruction and performing said specified floating point arithmetic operation upon said floating point data from the memory means.

4,961,163

SYSTEM FOR MONITORING AND REPORTING THE OPERABILITY AND CALIBRATION STATUS OF A PH SENSOR

Avron I. Bryan, 26 Country Club Rd., Cocoa Beach, Fla. 32931, and Michael R. Cushman, 521 Brandonwood Rd., Kingsport, Tenn. 37660

Filed Dec. 2, 1988, Ser. No. 279,574
Int. Cl.[5] G06F 15/46; G01N 27/26
U.S. Cl. 364—550 **8 Claims**



1. A test and monitoring system for providing on-line, real-time monitoring of the condition of a pH sensor, said pH sensor having a sensor electrode, a reference electrode, and electrolyte, and a pH-sensitive glass membrane, said sensor immersed in a process solution, comprising:

(a) a cathode electrode immersed in said process solution adjacent said sensor glass membrane;

(b) an anode electrode immersed in said process solution and spaced apart from said cathode electrode;

(c) a source of direct current;

(d) control means for periodically controlling said direct current source to cause current flow between said anode electrode and said cathode electrode for producing electrolysis in said process solution to thereby decrease the amount of hydrogen ions incident on said sensor, said decrease in hydrogen ions producing an increase in pH

relative to the pH due to the process, wherein said pH sensor produces a test signal pulse having a rise time, a maximum magnitude, and a decay time, said pulse superimposed on a process solution pH signal from said pH sensor;

(e) means for measuring and storing representations of said rise time, said maximum magnitude, and said decay time as calibrated values of said test signal pulse during initial calibration of said system; and

(f) means for comparing said rise time, said maximum magnitude, and said decay time of said test signal pulse, during operation of said system, with said calibrated values, and for detecting deterioration of said pH sensor when present.

4,961,164

SEMICONDUCTOR MEMORY DEVICE WITH DUAL SELECTION CIRCUITRY INCLUDING CMOS AND BIPOLAR TRANSISTORS

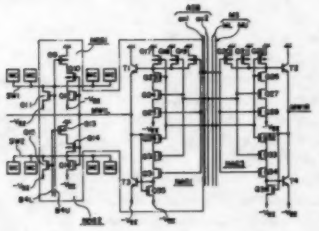
Shuuichi Miyaoka, Ohme; Masanori Odaka, Kodaira; Hiroshi Higuchi, and Toshikazu Arai, both of Ohme, all of Japan, assignors to Hitachi, Ltd.; Hitachi Microcomputer Engineering, both of Tokyo and Akita Electronics, Co., Ltd., Akita, all of, Japan

Continuation of Ser. No. 168,950, Mar. 16, 1988, abandoned. This application Oct. 31, 1989, Ser. No. 430,907

Claims priority, application Japan, Mar. 16, 1987, 62-58857

Int. Cl.[5] G11C *7/00, 11/407, 11/408*

U.S. Cl. 365—177 **30 Claims**



1. A semiconductor memory device comprising:

a plurality of memory cell array blocks arranged in a row;

a plurality of first word lines disposed on said memory cell array blocks; and

a first selection means comprised of a p-channel MOS FET, an n-channel MOS FET and a bipolar transistor for selecting one of said first word lines in accordance with first selection signals,

said each memory cell array block further including:

a plurality of second word lines disposed in parallel with said first word lines on the memory cell array block, wherein each of said second word lines is coupled to one of said first word lines;

a plurality of memory cells connected to each of said second word lines;

a plurality of second selection means connected to said second word lines, respectively, and each comprised of a p-channel MOS FET and an n-channel MOS FET, but not a bipolar transistor, for selecting one of said second word lines in accordance with a second selection signal, wherein said selected second word line is coupled through a corresponding one of said second selection means to one of said first word lines which has been selected by said first selection means; and

first and second supply terminals to which first and second power supply voltages are supplied, respectively,

wherein said p-channel MOS FET of each second selection means has a source-drain path coupled between said first supply terminal and a corresponding second word line, and wherein said n-channel MOS FET of each second selection means has a source-drain path coupled between a corresponding second word line and said second supply terminal.

4,961,165

SEMICONDUCTOR MEMORY DEVICE HAVING A CHARGE BARRIER LAYER FOR PREVENTING SOFT ERROR

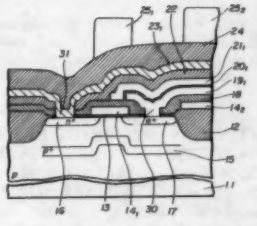
Taiji Ema, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Nov. 10, 1988, Ser. No. 269,689

Claims priority, application Japan, Nov. 17, 1987, 62-288512

Int. Cl.[5] G11C *11/34;* **H01L** *29/78*

U.S. Cl. 365—182 **6 Claims**



1. A semiconductor memory device comprising:

a semiconductor substrate having source and drain regions each having a conduction type opposite to that of the semiconductor substrate;

an insulation film formed on a main surface of the semiconductor substrate having first and second contact windows; and

a gate electrode formed on the insulation film so as to be located between the source and drain regions;

the semiconductor substrate having a charge barrier layer which has the same conduction type as the semiconductor substrate and has an impurity concentration higher than that of the semiconductor substrate;

the charge barrier layer being spaced apart from said main surface and formed so that a depth (d_1) of the charge barrier layer located under the gate electrode measured from the main surface of the semiconductor substrate is smaller than a depth (d_2) of the charge barrier layer located under the source and drain regions measured from the main surface of the semiconductor substrate.

4,961,166

DYNAMIC RAM HAVING A FULL SIZE DUMMY CELL

Katsuyuki Sato, Kodaira; Kazumasa Yanagisawa, Kokubunji, and Kunio Ono, Fucyu, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed May 2, 1985, Ser. No. 729,859

Claims priority, application Japan, May 7, 1984, 59-89407; Mar. 18, 1985, 60-52228

Int. Cl.[5] G11C *7/00, 11/404*

U.S. Cl. 365—189.01 **13 Claims**

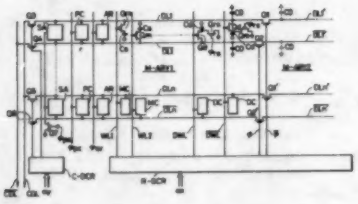
1. A dynamic RAM comprising:

first and second data lineseach having a plurality of memory cells coupled thereto which are disposed in a first memory array;

a sense amplifier for differentially amplifying the difference between a reference level applied to one of said first and second data lines and a data signal level applied to the other of said first and second data lines by one of said memory cells; and

a first switch circuit coupled to said one of said first and second data lines for electrically coupling an additional

capacitor comprising a data line capacitance of a third data line, contained in a second memory array different from said first memory array, and having a plurality of



memory cells coupled thereto to said one data line to make the data line capacitance of said one data line larger than that of said other data line.

4,961,167

SUBSTRATE BIAS GENERATOR IN A DYNAMIC RANDOM ACCESS MEMORY WITH AUTO/SELF REFRESH FUNCTIONS AND A METHOD OF GENERATING A SUBSTRATE BIAS THEREIN

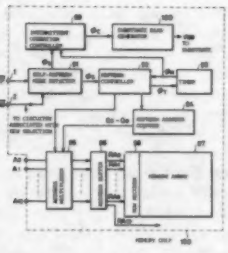
Masaki Kumanoya; Yasuhiro Konishi; Katsumi Dosaka; Takahiro Komatsu, and Yoshinori Inoue, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 18, 1989, Ser. No. 381,347

Claims priority, application Japan, Aug. 26, 1988, 63-213204; Dec. 8, 1988, 63-312416

Int. Cl.[5] G11C *11/403*

U.S. Cl. 365—189.09 **24 Claims**



1. A dynamic random access memory device formed on a semiconductor substrate (150) and having a self-refresh function by which memory cell data therein are automatically refreshed in response to an external refresh instruction signal, comprising:

means (91) for generating an internal refresh instruction signal ϕ_S in response to an external refresh instruction signal (REF; $\overline{RAS}$ $\overline{CAS}$,

means (94, 95, 96, 98) for refreshing said memory cell data,

means (92, 93) for generating a signal (ϕ_R) for enabling said data refresh means in response to said internal refresh instruction signal, said enabling signal being generated cyclically at a predetermined interval during the period of time when said internal refresh signal remains in activated state,

means (100) for biasing said semiconductor substrate to a predetermined potential, and

control means (99, 99,) for activating said biasing means for a time period shorter than said predetermined interval of said enabling signal in response to said refresh instruction signal and the state of activation of said enabling signal.

4,961,168

BIPOLAR-CMOS STATIC RANDOM ACCESS MEMORY DEVICE WITH BIT LINE BIAS CONTROL

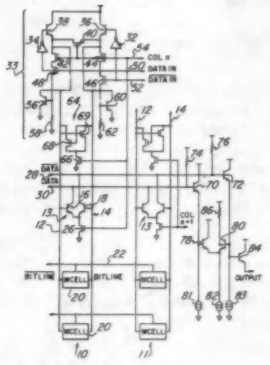
Hiep V. Tran, Carrollton, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 18,874, Feb. 24, 1987, Pat. No. 4,825,413. This application Mar. 21, 1989, Ser. No. 326,755

The portion of the term of this patent subsequent to Sep. 12, 2006, has been disclaimed.

Int. Cl.[5] G11C *11/413*

U.S. Cl. 365—189.11 **4 Claims**



1. A read/write memory, comprising:

an array of memory cells arranged in rows and columns;

a plurality of bit line pairs, each of said bit line pairs comprising a true bit line and a complement bit line, each of said bit line pairs associated with a column of memory cells in said array;

a row decoder for receiving a row address signal and for selecting a row of memory cells in said array responsive to said row address signal;

a column decoder for receiving a column address signal and for selecting a column of memory cells in said array responsive to said column address signal;

a sense amplifier coupled to the bit lines of the column of said array selected by said column decoder for sensing the data stored in the memory cell in said selected column which is in said selected row, said sense amplifier comprising first and second emitter-coupled bipolar transistors, each having its base connected to a corresponding bit line of the bit line pair associated with the selected column;

a plurality of first pull-up transistors, each respectively connected to a true bit line in a column, each first pull-up transistor having its emitter connected to its associated true bit line and its collector connected to a power supply node, and having a base;

a plurality of second pull-up transistors, each respectively connected to a complement bit line in a column, each second pull-up transistor having its emitter connected to its associated complement bit line and its collector connected to said power supply node, and having a base;

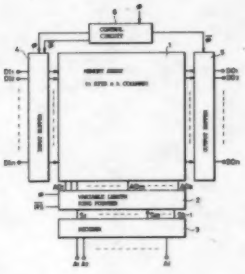
write circuitry for biasing to a reference potential either the true bit line or the complement bit line for the column selected by said column decoder, responsive to an input data signal indicating the data state to be written to the selected memory cell; and

pull-up control circuitry for biasing the bases of each of said first and second pull-up transistors responsive to said input data signal indicating a read operation, so that each of said first and second pull-up transistors are in an on-state during a read operation.

4,961,169
METHOD OF AND APPARATUS FOR GENERATING VARIABLE TIME DELAY

Tetsuya Matsumura, and Masahiko Yoshimoto, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 23, 1987, Ser. No. 137,145
Claims priority, application Japan, Dec. 24, 1986, 61-309808
Int. Cl.[5] G11C 7/00
U.S. Cl. 365—189.12 **8 Claims**



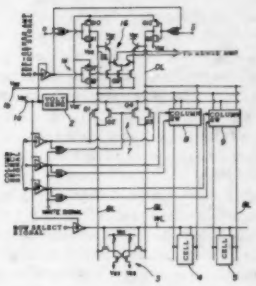
1. A variable delay circuit comprising:
a memory cell array having a plurality of memory cells arranged in a two-dimensional array,
variable length recirculating shift register means for sequentially accessing a plurality of memory cells in said memory cell array within a predetermined constant range in said memory cell array,
means for selecting the length of said recirculating shift register means to establish said predetermined constant range,
input means for writing information into the memory cells accessed by said variable length recirculating shift register means, and
output means for reading out information stored in said accessed memory cells at a time delay corresponding to the length selected by said variable length recirculating shift register means.

4,961,170
LOGIC CIRCUIT USING BIPOLAR COMPLEMENTARY METAL OXIDE SEMICONDUCTOR GATE AND SEMICONDUCTOR MEMORY DEVICE HAVING THE LOGIC CIRCUIT

Fujitsu Limited, Kawaski; Yasuhiko Maki, Kawasaki, and Osamu Nomura, Kasugai, both of Japan, assignors to Fujitsu Limited, Kawasaki and Fujitsu Vlsi Limited, Kasugai, both of, Japan

Division of Ser. No. 269,413, Nov. 10, 1988, Pat. No. 4,906,868. This application Dec. 19, 1989, Ser. No. 452,421
Claims priority, application Japan, Nov. 16, 1987, 62-288730
Int. Cl.[5] G11C 7/00
U.S. Cl. 365—190 **10 Claims**

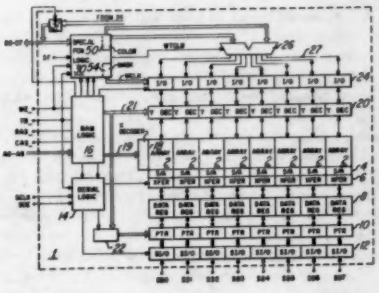
1. A semiconductor memory device using bipolar complementary metal oxide semiconductor (CMOS) gates, comprising:
a first power source line for supplying a first power source voltage;
a second power source line for supplying a second power source voltage which is lower than the first power source voltage;
a plurality of word lines;
a plurality of bit lines intersecting said word lines;
a plurality of memory cells coupled at intersections of said word lines and said bit lines;
column switches coupled to corresponding ones of said bit lines, each of said column switches having a first p-channel metal oxide semiconductor transistor, said first p-channel MOS transistor having one of a source and a drain thereof coupled to a corresponding one of said bit lines;
column drivers, respectively coupled to said column witches, each of said column drivers supplying a column selection signal to a gate of the first p-channel MOS transistor of said column switch, each said column driver having bipolar transistors coupled in series between the first and second power source lines;
data lines respectively coupled to said column switches, each of said data lines being coupled to another of the source and the drain of the first p-channel MOS transistor of said column switch;
sense amplifiers respectively coupled to said data lines, each of said sense amplifiers for detecting a read signal outputted on said data lines; and
voltage generating means for generating a third power source voltage which is a predetermined value lower than the first power source voltage and higher than the second power source voltage, said data lines being coupled to said voltage generating means so that the third power source voltage is supplied to said data lines.



4,961,171
READ/WRITE MEMORY HAVING AN ON-CHIP INPUT DATA REGISTER

Raymond Pinkham, Missouri City, and Anthony M. Balistreri, Houston, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Continuation-in-part of Ser. No. 53,200, May 21, 1987, Pat. No. 4,817,058. This application Aug. 5, 1987, Ser. No. 81,926
Int. Cl.[5] G11C 8/00
U.S. Cl. 365—230.05 **15 Claims**



1. A memory device, comprising:
an array of memory cells, arranged in rows and columns;

row address means, for receiving a row address and for selecting a row of said array corresponding to said row address;

sensing means, for sensing the contents of memory cells in said selected row;

column address means, for receiving a column address and for selecting a memory cell in said selected row corresponding to said column address;

data input means, for receiving data to be written to said selected memory cell in said selected row;

a register, for storing data to be written to said selected memory cell;

write mode select means, for receiving a special function signal and for generating a write mode control signal responsive thereto, said write mode control signal having a first logic state and a second logic state;

a write multiplexer, having a first input connected to said data input means, having a second input connected to said register, and having a control input receiving said write mode control signal, for selecting the contents of said register responsive to said write mode control signal being in said first logic state, and for selecting the data received by said data input means responsive to said write mode control signal being in said second logic state; and

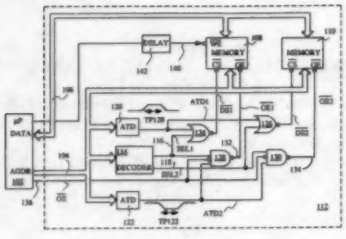
writing means, connected to said write multiplexer and to said array, for receiving a write enable signal and for communicating the output of said write multiplexer to said selected memory cell in said selected row responsive to said write enable signal.

4,961,172

DECODER FOR A MEMORY ADDRESS BUS

Alexander Shubat, Newark, and Yoram Cedar, Sunnyvale, both of Calif., assignors to WaferScale Integration, Inc., Fremont, Calif.

Filed Aug. 11, 1988, Ser. No. 231,122
Int. Cl.[5] G11C *7/00*
U.S. Cl. 365—230.06 **15 Claims**



1. A circuit including at least a first memory device, said circuit comprising:

an address bus for receiving addresses, said address bus including a plurality of lines, said first memory device being coupled to at least some of said lines within said address bus;

decoder means for decoding address signals on at least some of said lines within said plurality of lines and for asserting a first select signal in response thereto, said first select signal being used to select said first memory device; and

means for enabling said first memory device before said decoder means asserts said first select signal and

(a) continuing to enable said first memory device if said decoder means thereafter asserts said first select signal, but

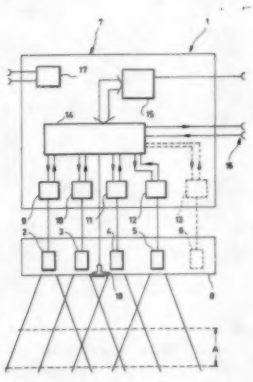
(b) disabling said first memory device if said decoder means fails to assert said first select signal after said decoder means has decoded said address signals.

4,961,173

CONTROL SENSOR FOR A CONSTRUCTION MACHINE

Willibald Sehr, Waldburn-Ellar, and Martin Zarniko, Diez, both of Fed. Rep. of Germany, assignors to Moba-Electronic Gesellscharft fur Mobil-Automation mbH, Fed. Rep. of Germany

Filed May 10, 1989, Ser. No. 349,624
Claims priority, application Fed. Rep. of Germany, May 11, 1988, 3816198
Int. Cl.[5] G01S *15/00*
U.S. Cl. 367—96 **6 Claims**



1. Control sensor for a construction machine for generating height control signals by detecting the relative position of the sensor to a guide cable, wherein:

the control sensor comprises at least two supersonic sensors, at least one of which serves as a transmitter/receiver element;

the supersonic sensors are connected to an evaluation means which serves to generate the height control signals and a signal of direction which indicates the exceeding of a certain range of width; and

the supersonic sensors are positioned at a right angle to the direction of movement of the construction machine, and are arranged at a distance from the guide cable that detection angles of supersonic sensor cones generated by said supersonic sensors overlap at said distance.

4,961,174

HIGH DATA RATE CONTINUOUS WAVE TOWED SONAR

Willis A. Teel, Panama City, and James T. Christoff, Lynn Haven, both of Fla., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 9, 1977, Ser. No. 795,671
Int. Cl.[5] G01S *15/08*
U.S. Cl. 367—97 **9 Claims**

1. A sonar system comprising in combination:

an acoustic projector for insonifying a water medium in a predetermined azimuthal zone about said projector with continuous wave acoustic energy of a predetermined frequency;

oscillator means for driving said projector at said predetermined frequency;

a receiving array disposed in a predetermined vertically spaced relation to said projector, said array being characterized by a multiplicity of electroacoustic elements, each responsive to acoustic energy arriving from a predetermined azimuth sector to generate corresponding electrical signals including reverberation signals and target echo signals;

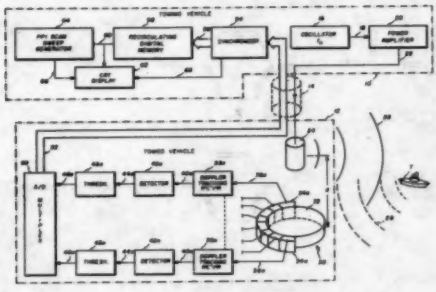
a multiplicity of parallel signal processing channels, each

connected to one of said multiplicity of receiving elements and each of said channels comprising receiver means, amplitude detector means, and threshold means for selectively passing detected target signals;

analog to digital multiplexer means for converting target signals from each of said channels into digital signals representative thereof;

cable means, connected to said multiplexer means, for transmitting said digital signals;

synchronizer means, connected to receive said digital signals, for effecting predetermined distribution of the digital signals corresponding to each of said channels and their respective azimuth sectors;



recirculating digital memory means, connected to receive distribution of said digital signals, for providing reiterative readout thereof at a predetermined rate; and

display means, coupled to said recirculating digital memory means, for providing a visual display of target echo data for each of said predetermined azimuth sectors;

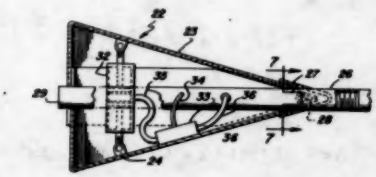
each of said receiver means comprising a reverberation tracking filter and a target doppler tracking filter, and further being characterized by the improvement comprising means for eliminating spillover of said predetermined frequency from said projector to said receiving array.

4,961,175

LOW FREQUENCY SOUND SOURCE FOR ACOUSTIC SWEEPS

Joseph E. Blue, and Thomas C. Watson, both of Panama City, Fla., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 12, 1967, Ser. No. 690,718
Int. Cl.[5] G01V *1/02*
U.S. Cl. 367—142 **11 Claims**



1. A generator for producing an acoustic signal over a predetermined frequency band having a predetermined center frequency in an aqueous medium comprising:

a body portion shaped so as to produce a cavitation void adjacent one surface of said body portion when exposed to a predetermined fluid velocity across the surface of said body portion;

a source of gas;

conduit means joining said source of gas and said body portion; and

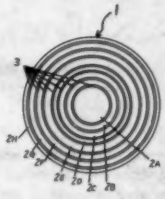
nozzle means mounted on said one surface of said body portion and in communication with said source of gas via said conduit means, said nozzle being constructed so as to supply said cavitation void with a predetermined amount of gas sufficient to form a self-oscillating gas bubble resonant over said predetermined frequency band.

4,961,176

ULTRASONIC PROBE

Hideyuki Tanaka, Kawaguchi; Koetsu Saito, Tokyo; Ikuo Sakai, Kawasaki, and Masami Kawabuchi, Yokohama, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Filed Dec. 7, 1989, Ser. No. 447,491
Claims priority, application Japan, Dec. 9, 1988, 63-312227
Int. Cl.[5] H04R *17/00*
U.S. Cl. 367—155 **6 Claims**



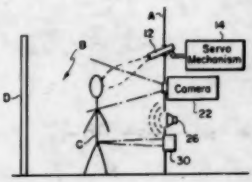
2. An ultrasonic probe comprising a first group of transducer element extending concentrically; and a second group of transducer elements extending concentrically and extending outward of the elements in the first group; wherein the elements in the first and second groups form a front surface via which ultrasonic wave is transmitted and received; areas of the respective elements in the second group over the front surface are substantially equal to each other; and areas of the respective elements in the first group over the front surface are substantially equal to half the areas of the respective elements in the second group.

4,961,177

METHOD AND APPARATUS FOR INPUTTING A VOICE THROUGH A MICROPHONE

Kensuke Uehara, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jan. 27, 1989, Ser. No. 302,264
Claims priority, application Japan, Jan. 30, 1988, 63-20291
Int. Cl.[5] H04B *1/00, 11/00*
U.S. Cl. 367—197 **23 Claims**



1. An apparatus for inputting a voice through a microphone mounted at a position facing to a speaking person, comprising:

image pick-up means for picking up an image of the speaking person;

means for detecting the position of a mouth of the person from the image picked up by the picking up means; and

means for moving the microphone in accordance with the

position of the mouth detected by the mouth detecting means.

4,961,178

METHOD OF ERASABLE RECORDING AND READING OF INFORMATION

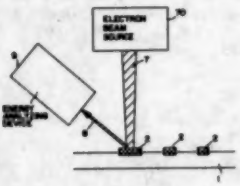
Shunsuke Matsuda, Osaka; Yasuhiro Hioki, Hirakata, and Masaaki Ueda, Saita, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Oct. 21, 1987, Ser. No. 110,853

Claims priority, application Japan, Oct. 21, 1986, 61-249980/1986; Mar. 18, 1987, 62-62924/1987

Int. Cl.[5] G11B 7/00

U.S. Cl. 369—103 **15 Claims**



1. A method of erasing information recorded on a substrate by the presence or absence of a deposited specific element on said substrate, comprising sputtering the deposited specific element from the substrate by an ion beam irradiation of an element on said substrate.

4,961,179

CURABLE REACTION COMPOSITIONS FOR PRODUCING DATA CARRIERS

Werner Klöker; Dieter Freitag, both of Krefeld; Walter Uerdingen, Leverkusen; Bernhard Hess, Moers, and Helmut Schmid, Krefeld, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jul. 13, 1987, Ser. No. 72,395

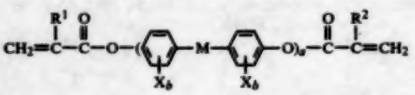
Claims priority, application Fed. Rep. of Germany, Jul. 25, 1986, 3625165

Int. Cl.[5] G11B 5/62; C08F 228/04

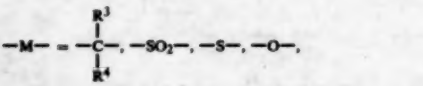
U.S. Cl. 369—288 **6 Claims**

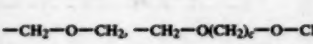
1. A data carrier comprising a curable reaction composition containing

A. 30 to 90 parts by weight of polymerizable compounds of the formula

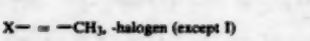

(I)

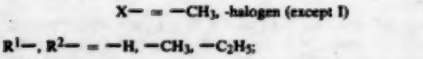
wherein

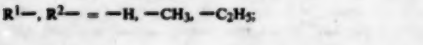




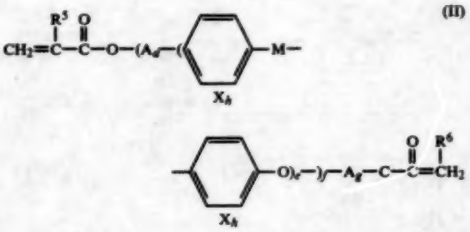
single bond



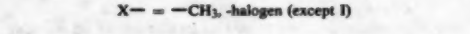


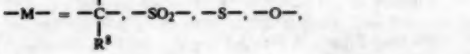


and optionally of the formula

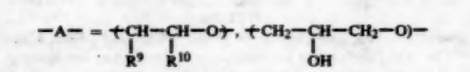

(II)

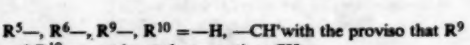
wherein

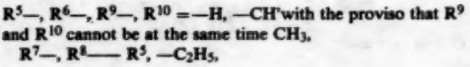


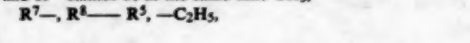


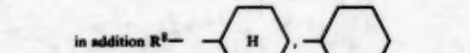
single bond

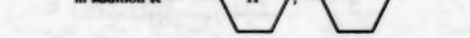


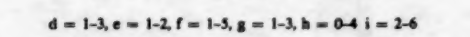


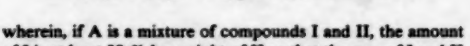


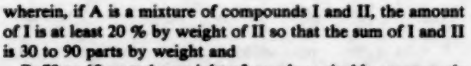


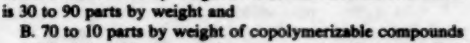


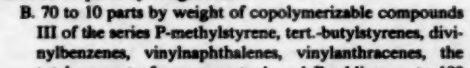


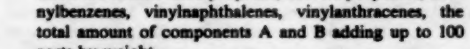


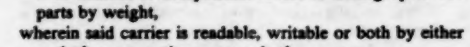


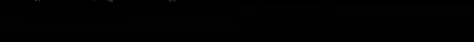












wherein, if A is a mixture of compounds I and II, the amount of I is at least 20 % by weight of II so that the sum of I and II is 30 to 90 parts by weight and

B. 70 to 10 parts by weight of copolymerizable compounds III of the series P-methylstyrene, tert.-butylstyrenes, divinylbenzenes, vinylnaphthalenes, vinylanthracenes, the total amount of components A and B adding up to 100 parts by weight,

wherein said carrier is readable, writable or both by either optical or magnetic means or both.

4,961,180

ARRANGEMENTS FOR PRODUCING AND RECOGNIZING INFORMATION IDENTIFYING NON-OCCUPIED TRANSMISSION PATHS IN A DIGITAL TRANSMISSION SYSTEM

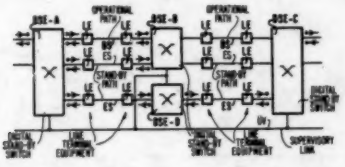
Dieter Schwarz, and Hans-Dieter Kauschke, both of Nüremberg, Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 887,581, Jul. 18, 1986, abandoned. This application Nov. 22, 1988, Ser. No. 275,643

Claims priority, application Fed. Rep. of Germany, Jul. 20, 1985, 3526020

Int. Cl.[5] H04J *3/12, 1/16, 3/14*

U.S. Cl. 370—110.1 **8 Claims**



1. An arrangement for identifying non-occupied transmission paths in a digital transmission system, the digital transmission system including:

(a) a currently operating set of at least one occupied transmission path for transmitting:

(i) useful time-division multiplexed information in a plurality of time-division multiplex frames having a prescribed format; and

(ii) system alarm words; and

(b) a stand-by set of at least one non-occupied transmission path for replacing an occupied transmission path of the currently operating set in case of disturbance; the arrangement comprising:

(c) means for producing a digital signal pattern, which is periodic, is distributed with respect to respective ones of the time-division multiplex frames, and does not mimic:

(i) alignment of said time-division multiplex frames;

(ii) the system alarm words; or

(iii) the useful information; and

(d) means for applying a signal comprising said pattern to said at least one non-occupied transmission path of the stand-by set.

4,961,181

ACOUSTIC TRANSIENT GENERATOR

Myron A. Elliott, Panama City, Fla., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 4, 1964, Ser. No. 388,348

Int. Cl.[5] F42B *22/42;* **H04K** *3/00;* **B60B** *33/08*

U.S. Cl. 367—142 **10 Claims**

1. A transducer adapted for generating and broadcasting broadband acoustical energy throughout a predetermined volume of sea water comprising in combination,

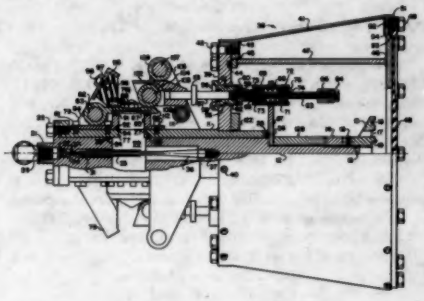
a resilient diaphragm with one surface thereof exposed to said sea water,

means spatially disposed from said diaphragm for the timely striking of the other surface thereof,

chamber means contiguously disposed with said diaphragm striking means adapted for having a predetermined air pressure build up therein,

valve means attached to said chamber means for timely releasing the air pressure built up therein directly into said sea water, and

means connected between said valve means and the aforesaid diaphragm striking means for effecting the opening of



said valve means and the striking of said diaphragm at predetermined synchronized times.

4,961,182

INFORMATION RETRIEVING SYSTEM WITH LEVEL CLAMPING

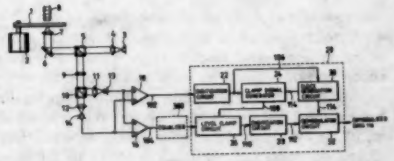
Atsushi Saito, Ichikawa, and Takeshi Maeda, Kokubunji, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 29, 1988, Ser. No. 213,135

Claims priority, application Japan, Jul. 1, 1987, 62-162313; Sep. 8, 1987, 62-223024; Apr. 28, 1988, 63-103905

Int. Cl.[5] G11B *7/00*

U.S. Cl. 369—124 **73 Claims**



29. A method of reproducing data encoded on a track which has a clamp area and a recording area therealong, said encoded data being recorded on said recording area by a data recording means, and said encoded data are not recorded on said clamp area, said method comprising:

detecting reflected light as a laser spot scans along said track and producing an output signal indicative thereof;

extracting a read data signal from said output signal indicative of said reflected light;

holding a level of said read data signal at a reference level when said laser spot scans on said clamp area to produce a corrected data signal; and

digitizing said corrected data signal in accordance with a threshold level and obtaining a data pulse indicative of said encoded data.

4,961,183

OPTICAL DISK ARRANGEMENT WITH CLOSED CONTOURS WHOSE ENTIRE EXTENT REPRESENTS INFORMATION

Claude Tinet, Paris, France, assignor to Thomson-CSF, Paris, France

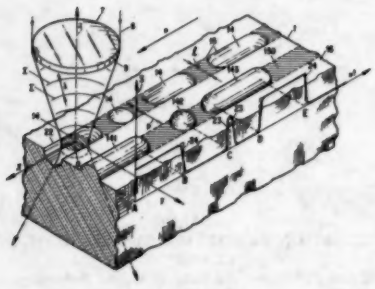
Continuation of Ser. No. 96,317, Sep. 9, 1987, Pat. No. 4,868,808, which is a continuation of Ser. No. 925,491, Oct. 29, 1986, abandoned, which is a continuation of Ser. No. 667,100, Nov. 1, 1984, abandoned, which is a division of Ser. No. 545,110, Oct. 25, 1983, Pat. No. 4,491,940, which is a continuation of Ser. No. 108,499, Dec. 31, 1979, abandoned, which is a continuation of Ser. No. 793,270, May 3, 1977, abandoned, which is a continuation of Ser. No. 390,715, Aug. 23, 1973, abandoned. This application May 23, 1989, Ser. No. 355,503

Claims priority, application France, Aug. 25, 1972, 72 30346

The portion of the term of this patent subsequent to Sep. 19, 2006, has been disclaimed.

Int. Cl.[5] G11B *7/24, 7/09*

U.S. Cl. 369—275.4 **148 Claims**



1. An optical readable carrier comprising:

a substrate on which data elements are stored as a succession of projections with respect to a reference surface, the succession of projections forming tracks, each projection having substantially the same width, which width does not exceed 2 microns, a length equal to or greater than its width, and a closed contour in the reference surface, said closed contour being diffractive along its entire extent, wherein each of said projections has a respective one of said data elements stored continuously along said entire length of said diffractive contour and diffraction occurs along the entire length of said data element continually indicative of the recorded information, successive data elements along a track being separated by clearance spaces, at least as long as the width of a data element, in the reference surface, with the information contained in said stored data elements being indicated by the continuous extent of each of said closed diffractive contours and by the extent of each of said clearance spaces, the tracks being separated from one another by clearance bands in the reference surface, the tracks having a pitch from one track to the next of at least two times the width of a data element; and

a reflective coating on said reference surface and projections.

4,961,184

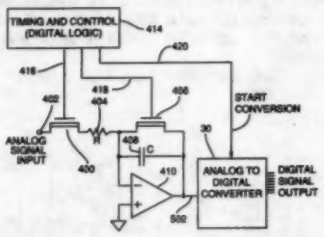
INTEGRATE AND HOLD AMPLIFIER

Jeffrey R. Owen, Portland, Oreg., assignor to AT&E Corporation, San Francisco, Calif.

Filed Jan. 31, 1989, Ser. No. 304,526

Int. Cl.[5] H04J *1/00*; H04B *1/10, 3/0*; H03K *5/00*

U.S. Cl. 370—76 **15 Claims**



1. A system including in combination:

means for receiving an analog signal which has a data signal component located in a relatively narrow frequency band,

an integrate and hold circuit which samples said data signal,

said integrate and hold circuit having an integrate time such that the frequency response of said integrate and hold circuit has a zero located at a frequency which is aliased into said relatively narrow frequency band,

whereby interference due to noise from higher frequencies is minimized.

4,961,185

METHOD FOR CONTROLLING A TERMINAL EQUIPMENT COUPLED TO AN INTEGRATED SERVICES DIGITAL NETWORK AND A TERMINAL EQUIPMENT BASED ON THE SAME

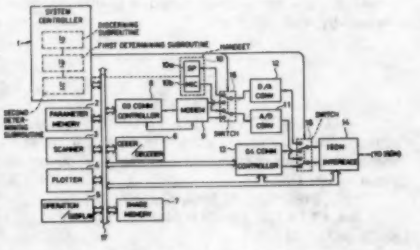
Mitsuji Sawada, Tama, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Jul. 7, 1989, Ser. No. 376,624

Claims priority, application Japan, Jul. 11, 1988, 63-170809

Int. Cl.[5] H04N *1/00*

U.S. Cl. 370—79 **22 Claims**



1. A method for controlling a terminal equipment coupled to an intergrated services digital network (ISDN) through a single communication line, comprising the steps of:

discerning whether a message supplied from said ISDN is received, said message being used at the time of setting up a call;

determining, each time said message is received, as to whether or not said message includes information indicating whether a different terminal equipment which said terminal equipment communicates with is a terminal coupled to either an ISDN or an analog network other than

said ISDN, said analog network being coupled to said ISDN;

determining whether the different terminal equipment is a terminal coupled to said ISDN or said analog network other than the ISDN by referring to said information included in said message;

executing a first communication control suitable for exchanging data with the different terminal equipment through said ISDN, when the different terminal equipment is determined to be a terminal coupled to said ISDN by referring to said information in said message; and

executing a second communication control suitable for exchanging data with the different terminal equipment through said ISDN and said analog network connected thereto, when the different terminal equipment is determined to be a terminal coupled to said analog network other than said ISDN by referring to said information included in said message.

4,961,186

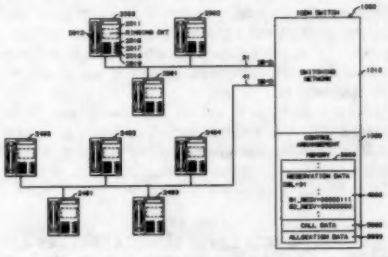
COMMUNICATION CHANNEL REALLOCATION

Bopsi Chandramouli, Aurora; Gary L. Epping, Woodridge, and Susan J. Tripp, Warrenville, all of Ill., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Nov. 30, 1988, Ser. No. 278,085

Int. Cl.[5] H04L *12/00*

U.S. Cl. 370—79 **24 Claims**



1. A method for use by a switching system connectable to a plurality of terminals by a single line comprising a plurality of channels, said method comprising

in response to one call, allocating one of said plurality of channels of said line for the exclusive use of one of said plurality of terminals, and

enabling another one of said plurality of terminals to process said one call by reallocating said one channel for the exclusive use of said other terminal, said method further comprising

before said enabling step, determining whether said one terminal requires said one channel to process any calls other than said one call, and

wherein said enabling step comprises upon determining that said one terminal does not require said one channel to process any calls other than said one call, enabling said other terminal to process said one call by reallocating said one channel for the exclusive use of said other terminal.

4,961,187

PBX SYSTEM WITH ASSIGNABLE RELATIONSHIPS BETWEEN NETWORK LOOPS AND PORTS

Vijay K. Gupta, Cupertino, Calif., assignor to BNR Inc., Mountain View, Calif.

Filed Aug. 11, 1989, Ser. No. 392,466

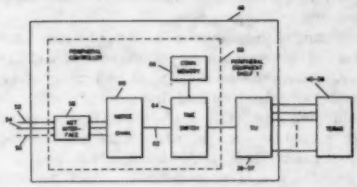
Int. Cl.[5] H04J *3/02*; H04Q *11/04*

U.S. Cl. 370—85.120 **8 Claims**

5. A peripheral controller for a PBX system comprising:

means for accepting a first plurality of channels of first digital data from a first network loop;

means for accepting a second plurality channels of second digital data from a second network loop;



means for combining said first plurality of channels with said second plurality of channels to produce a third digital data;

means for communication portions of said digital data with at least first and second terminals; and

said means for communicating including a time switch.

4,961,188

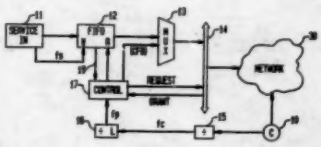
SYNCHRONOUS FREQUENCY ENCODING TECHNIQUE FOR CLOCK TIMING RECOVERY IN A BROADBAND NETWORK

Chi-Leung Lau, Eatontown, N.J., assignor to Bell Communications Research, Inc., Livingston, N.J.

Filed Sep. 7, 1989, Ser. No. 404,331

Int. Cl.[5] H04J *3/06*

U.S. Cl. 370—94.2 **15 Claims**



8. A method of recovering at a destination node of an ATM telecommunication network the timing clock of an isochronous service signal input at a source node of said network, which method comprises:

(a) establishing at each of said source and destination nodes a first node control clock having a fixed timing relation to the basic timing source of said network, said first clock having a frequency greater than the frequency of said service input timing clock;

(b) establishing at each of said source and destination nodes a second node control clock having a fixed timing relation to said first node control clock, the frequency ratio of said first to said second clock being equal to the number of service information bits in a packet cell;

(c) accumulating the information bits of said service input in a source node packetizing means buffer at the frequency of said service input clock;

(d) transmitting cells from said packetizing means to said network at the frequency of said second control clock;

(e) monitoring the bit accumulation in said buffer with reference to a predesignated minimum threshold;

(f) disabling the transmission of at least one cell when said bit accumulation falls below said threshold;

(g) setting a cell flagging bit at a given location in at least one cell transmitted subsequent to said disabling;

(h) disassembling the transmitted cells received at said destination node;

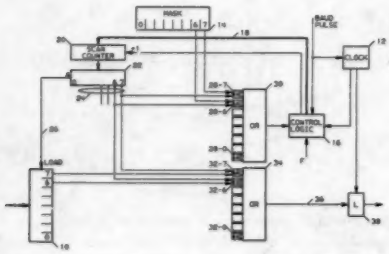
(i) accumulating in a destination node buffer the cell flagging bits from said disassembled cells;
(j) examining the accumulated cell flagging bits seriatim at the frequency of said second control clock;
(k) providing a first signal upon each occurrence of said at least one set flagging bits;
(l) determining the number of periods of said second control clock between successive occurrences of said first signal;
(m) providing a second signal upon each completion of a like number of periods of said first control clock;
(n) inhibiting a timing stream from said first control clock for one period at each occurrence of said second signal, thereby deriving a gapped timing clock; and
(o) smoothing said gapped timing clock to isochronous periods.

4,961,189

MULTIPLEXING SYSTEM SETTING THROUGH MASK REGISTERS

Maurice Cukier, Cagnes sur Mer; Daniel Pilost, La Gaude, and Dominique Rigal, Nice, all of France, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 23, 1989, Ser. No. 397,216
Claims priority, application European Pat. Off., Sep. 13, 1988, 88480029.3
Int. Cl.[5] H04J 3/00
U.S. Cl. 370—112 **10 Claims**



1. Data multiplexing system for dispatching an input serial bit stream onto a plurality of output ports comprising an aggregate register (10) common to the plurality of ports which is loaded every predetermined time interval by a number N of bits of the serial bit stream, and control devices, each one being associated with each port, and including a clock circuit (12) which determines the bit rate at which are output the data bits allocated to the associated port; said system being characterized in that each control device associated with a port comprises:

a mask register (14) loaded with a N-bit mask word wherein bits of a first polarity indicate which bits of said N bits contained in said aggregate register are to be transmitted to the associated port; and

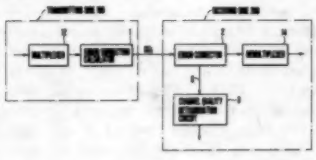
a scan counter (20) which starts being incremented at a frequency much higher than the highest bit rate at which can be output data bits allocated to a port at every transition of a given polarity of said clock circuit, until the mask bit corresponding to the scan counter contents is a bit of said first polarity, whereby the corresponding bit of said N bits contained in said aggregate register is transmitted to the associated port.

4,961,190

(1+N) HITLESS CHANNEL SWITCHING SYSTEM

Masahiro Nakajima, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Oct. 3, 1988, Ser. No. 251,643
Claims priority, application Japan, Oct. 2, 1987, 62-248082
Int. Cl.[5] G06F 11/10
U.S. Cl. 371—8.2 **2 Claims**



1. A (1+N) (N≧1) hitless channel switching system of a digital transmission system having an error correction function in which a transmitting side is connected to a receiving side through N regular channels and a single standby channel, comprising:

in said receiving side,

error correcting means for generating error corrected signals, said error correcting means detecting a bit error rate of each channel before error correction is performed;

channel degradation determining means for determining a degradation of a quality of one of said N regular channels on the basis of the bit error rate detected by said error correcting means before error correction is performed to output an information designating the one of said N regular channels; and

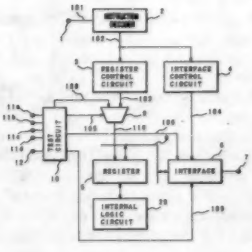
switching means for switching the one of said N regular channels to said standby channel with non-interruption in accordance with the information output from said channel degradation determining means.

4,961,191

TEST CIRCUIT FOR LOGIC CIRCUITS

Shin-ichi Nakagawa, and Hideyuki Terane, both of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 10, 1988, Ser. No. 269,507
Claims priority, application Japan, Sep. 2, 1988, 63-221166
Int. Cl.[5] G06F 11/00
U.S. Cl. 371—22.1 **2 Claims**



1. A circuit for testing logic circuits in a semiconductor comprising:

an interface circuit for inputting data to and outputting data from an external source;

an interface control circuit connected to said interface circuit which outputs a control signal for controlling said interface circuit;

an internal bus connected to said interface circuit;

a register connected to said internal bus;

a register control circuit connected to said register which outputs a control signal for controlling data input to and output from said register; and

a logic circuit connected to said register which performs logic operations with respect to data stored in said register and stores a result of the logic operations in said register;

a test circuit having first and second external input terminals connected to provide a first output signal which voids the control signal to said interface circuit from said interface control circuit and to said register from said register control circuit when a first signal is input on said first external input terminal, and to provide a second output signal to said interface circuit and said register when a second signal is input on said second external input terminal, said second control signal causing data from said interface circuit to be transferred to said register and stored therein and further causing data stored in said register to be output to the external source from said interface circuit.

4,961,192

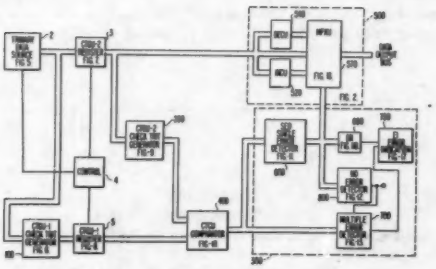
DATA ERROR DETECTION AND CORRECTION

Dwight W. Grimes, Boca Raton, Fla., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jul. 29, 1988, Ser. No. 225,976

Int. Cl.[5] G06F *11/10*

U.S. Cl. 371—37.1 **30 Claims**



1. A three-logic level (trinary) data error detection and correction system comprising:

a trinary data source comprising multiple trits of trinary data wherein each trit is either a 0, or 1, or 2 and a group of a selected number of two or more trits is a tryte;

a first check trit generator unit connected to said trinary data source for developing a first set of one or more check trits for each tryte from said trinary data source which is input into said first check trit generator;

a first trinary storage device connected to said first check trit generator for storage of said first set of check trits;

a second trinary storage device connected to said trinary data source for storage of each tryte input from said trinary data source;

a control unit connected to said trinary data source and to said first and second trinary storage devices;

a second check trit generator unit which functions identical to said first check trit generator connected to said second trinary storage device;

said control unit gating said trinary data from said second trinary storage data into said check trit generator unit which develops a second set of one or more check trits for each tryte;

a check trit comparator unit connected to said first trinary storage device and to said second check trit generator unit for developing a group of trinary syndrome trits for each pair of said set of check trits input from said first trinary storage device and said second check trit generator unit;

an error detector unit connected to said check trit comparator unit for receiving said syndrome trits to generate trinary error correction signals and trinary error indicator signals; and

a data corrector connected to said error detector means for either incrementing or decrementing a selected trit from said tryte under control of said error correction signals to make corrections to said tryte.

4,961,193

EXTENDED ERRORS CORRECTING DEVICE HAVING SINGLE PACKAGE ERROR CORRECTING AND DOUBLE PACKAGE ERROR DETECTING CODES

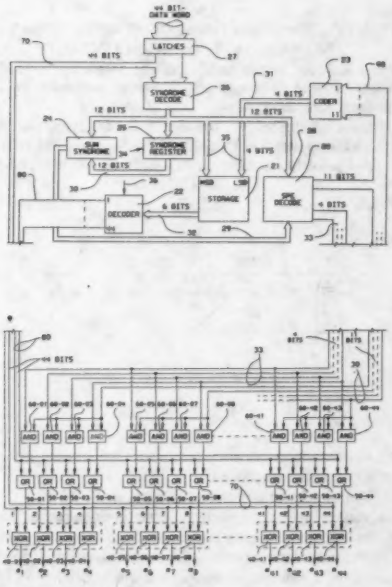
Pierre Debord, Tourrettes sur Loup, and Rene Glaise, Nice, both of France, assignors to International Business Machines, Armong, N.Y.

Filed Nov. 28, 1988, Ser. No. 276,583

Claims priority, application European Pat. Off., Apr. 29, 1988, 88480012.9

Int. Cl.[5] G06F *11/10*

U.S. Cl. 371—37.2 **17 Claims**



1. A digital error detection and correction apparatus for correcting an n-bit data word stored in a memory of an information processing system, said data word comprising a field of n-r data bits and a field of r error correcting code bits according to an error correcting code, said n-bit data words being organized in packages of b bits, said code being capable of correcting at least one error in one package having suffered at least one hard failure and a single soft error in a different package, said apparatus comprising:

syndrome generating means in which said error correcting code produces a first syndrome upon the condition that said data word suffers a first error due to at least one error in a first package and a single error in a second package, said second package being different from said first package, and in which said code produces a second syndrome upon the condition that said data word suffers a second error due to at least one error in said first package and a single error in a third package, said syndrome generating means also being responsive to an error correcting code in

which the equality of said first and second syndromes results in the equality of said first and second errors;

means for storing the syndrome of a first data word v read from said memory;

means for adding the syndrome of a second data word v' to said first syndrome, said second data word v' being generated from said first data word v by means of an invert write and an invert read procedure in said memory, said addition providing a result which is independent of the position of said soft error;

means for determining whether the result of said addition provides a syndrome of the single package type, in order to determine the specific package which has suffered at least one hard error; and

means responsive to said determination for directly locating the positions of the errors, and for correcting the data word.

4,961,194

COMPOUND SEMICONDUCTOR DEVICE HAVING NONALLOYED OHMIC CONTACTS

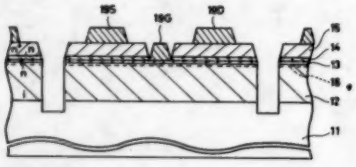
Shigeru Kuroda, Sagamihara; Takashi Mimura, Machida, and Seishi Notomi, Yamato, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Continuation of Ser. No. 169,890, Mar. 18, 1988, abandoned. This application Dec. 21, 1989, Ser. No. 455,853

Claims priority, application Japan, Mar. 18, 1987, 62-61097

Int. Cl.[5] H01L *29/80*

U.S. Cl. 357—22 **18 Claims**



1. A compound semiconductor device having nonalloyed ohmic contacts comprising:

a compound semiconductor substrate;

an active layer comprising a first semiconductor having a first electron affinity and being formed on the compound semiconductor substrate, the active layer having a channel region, a source region and a drain region;

an electron supply layer comprising a second semiconductor having a second electron affinity and being formed on the active layer, the second electron affinity being smaller than the first electron affinity so that a first heterojunction barrier exists at the junction between said active layer and said electron supply layer;

an intermediate layer comprising a third semiconductor formed on the electron supply layer and over the source and drain regions so that a second heterojunction barrier exists at the junction between said electron supply layer and said intermediate layer;

an ohmic contact layer comprising a fourth semiconductor formed on the intermediate layer;

source and drain electrodes formed on the ohmic contact layer and over the source and drain regions so as to make a nonalloyed ohmic contact with the ohmic contact layer; and

a Schottky gate electrode formed on the electron supply layer,

wherein said first and second heterojunction barriers enable a substantial number of electrons to tunnel therethrough.

4,961,195

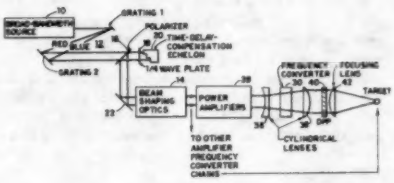
SYSTEMS FOR CONTROLLING THE INTENSITY VARIATIONS IN A LASER BEAM AND FOR FREQUENCY CONVERSION THEREOF

Stanley Skupsky; R. Stephen Craxton, both of Rochester, and John Soures, Pittsford, all of N.Y., assignors to The University of Rochester, Rochester, N.Y.

Filed Aug. 3, 1988, Ser. No. 228,131

Int. Cl.[5] H01S *3/13*

U.S. Cl. 372—31 **50 Claims**



1. The method of controlling intensity variation in a broad bandwidth laser beam having a plurality of frequencies which comprises the steps of propagating said beam as a spectrally dispersed beam with spatial dispersion of the frequencies thereof, and causing interference between the spatially dispersed portions of said beam of different frequency thereby temporally smoothing intensity variations in said beam.

4,961,196

SEMICONDUCTOR LASER

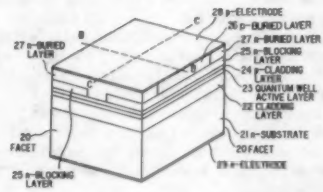
Kenji Endo, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Jul. 21, 1989, Ser. No. 382,878

Claims priority, application Japan, Jul. 22, 1988, 63-184163

Int. Cl.[5] H01S *3/19*

U.S. Cl. 372—45 **3 Claims**



1. In a semiconductor laser, the improvement, comprising:

a multi-layer structure including an active layer, a first and second cladding layers, said active layer including quantum well structure sandwiched by said first and second cladding layers, the bandgap energy of said cladding layers being wider than that of said active layer;

resonator facets perpendicular said multi-layers; and layers different in conductivity type from said first cladding layer provided over said first cladding layer and extending inwardly from said resonator facets to reduce injected carrier density in said active layer at said resonator facets to thereby make said active layer transparent to laser light at said resonator facets.

4,961,197

SEMICONDUCTOR LASER DEVICE

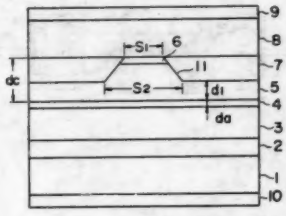
Toshiaki Tanaka, Kokubunji; Takashi Kajimura, Tokyo; Toshihiro Kawano, Ome, and Yuichi Ono, Tokyo, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 14, 1989, Ser. No. 339,125

Claims priority, application Japan, Sep. 7, 1988, 63-222310; Sep. 14, 1988, 63-228670; Oct. 19, 1988, 63-261485; Jan. 10, 1989, 01-1392; Mar. 1, 1989, 01-46503

Int. Cl.[5] H01S *3/19*

U.S. Cl. 372—45 27 Claims



18. A semiconductor laser device of a double heterostructure comprising an active layer formed on a semiconductor substrate, a first and a second cladding layer, the second cladding layer being disposed on the opposite side of the active layer from the semiconductor substrate and having a ridge stripe extending in the direction of extension of a laser cavity, a current-blocking and absorbing layer provided on the second cladding layer on each of both the sides of the ridge stripe, the effective transverse refractive index difference of the active layer being 8×10^{-4}–5×10^{-3}, n- and p-type impurities being together doped in the active layer, and a pair of electrodes being electrically connected to the corresponding first and second cladding layers, whereby self-pulsation is performed.

4,961,198

SEMICONDUCTOR DEVICE

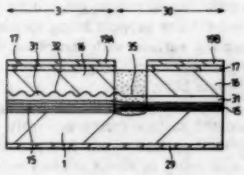
Masato Ishino, and Yoichi Sasai, both of Osaka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Filed Jan. 12, 1989, Ser. No. 296,020

Claims priority, application Japan, Jan. 14, 1988, 63-5809; Jun. 21, 1988, 63-153241

Int. Cl.[5] H01S *3/19*

U.S. Cl. 372—50 13 Claims



1. A semiconductor device comprising:

a semiconductor substrate having a plurality of mesa stripes whose widths are different from each other;

quantum well layers formed on the mesa stripes respectively and having different band gap energies, the quantum well layers including ultra-thin epitaxial layers respectively; and

semiconductor elements formed on the mesa stripes respectively and including the quantum well layers respectively.

4,961,199

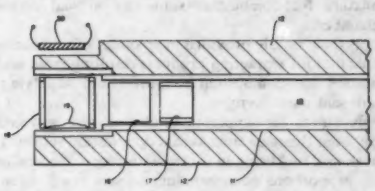
METHODS FOR REDUCING THE LOSS OF METAL IN A METAL VAPOR LASER

David B. Duncan, Auburn, and Terry W. Alger, Tracy, both of Calif., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Continuation of Ser. No. 210,180, Jun. 20, 1988, abandoned, which is a continuation of Ser. No. 911,942, Sep. 26, 1986, abandoned. This application Sep. 19, 1989, Ser. No. 409,990

Int. Cl.[5] H01S *3/22*

U.S. Cl. 372—56 2 Claims



1. In a lasing device in which a metal vapor is lased, said device comprising a main bore defining the interior of said bore, said interior comprising a hot zone in which the temperature is sufficient to maintain at least the predetermined vapor pressure of said metal required for lasing, the improvement comprising at least one trap for collecting condensed metal unavailable for lasing during continuous operation of said lasing device, said trap located outside of said hot zone and within said interior, and heating means external to said bore for providing heat to said trap to revaporize said condensed metal to thereby replenish said metal vapor.

4,961,200

PROCESS AND GENERATOR FOR GENERATING ATOMIC IODINE IN THE FUNDAMENTAL STATE, AND IODINE CHEMICAL LASER EMPLOYING SUCH

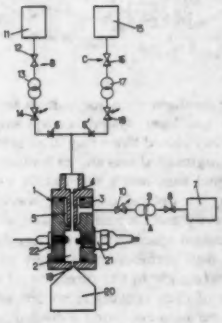
Claude Verdier, Neauphle Le Chateau; Bruno Leporcq, Paris; Eric Georges, Buc, and Roger Barraud, Longjumeau, all of France, assignors to Office National d'Etudes et de Recherche Aerospatiales, Chatillon, France

Division of Ser. No. 182,282, Mar. 10, 1988, Pat. No. 4,866,729, which is a continuation-in-part of Ser. No. 13,780, Feb. 12, 1987, abandoned. This application Jun. 5, 1989, Ser. No. 361,259

Claims priority, application France, Feb. 26, 1986, 86 02653

Int. Cl.[5] H01S *3/095*

U.S. Cl. 372—89 11 Claims



1. Iodine chemical laser, comprising:

a laser cavity;

a combustion chamber;

a first injector adapted to inject into said combustion chamber a fuel being an iodine compound selected from among HI, CF_3I, C_3F_7I, I_2 and CHI_3;

first supply means for supplying said fuel in adjustable amount and speed to said first injector;

a second injector adapted to inject into said combustion chamber a combustion supporter selected from among F_2 and NF_3;

second supply means for supplying said combustion supporter in adjustable amount and speed to said second injector;

combustion initiating means for initiating combustion of the mixture fuel-combustion supporter in said combustion chamber;

a supersonic nozzle provided in an outlet of said combustion chamber for extracting products resulting from said combustion fuel-combustion supporter and supplying them into said laser cavity;

supply means for supplying singlet oxygen into said laser cavity at the same time as said combustion resulting products; said fuel being in excess with respect to stoichiometric proportions corresponding to said combustion, richness ϕ of said iodine compound fuel with respect to said stoichiometric proportions being $0.5<\phi<2.5$ if the used combustion supporter is F_2 and $0.6<\phi<2.6$ if the used combustion supporter is NF_3;

the pressure inside said combustion chamber during said combustion being between 50 torrs and 5 bars.

4,961,201

WAVEGUIDE CONFIGURATION

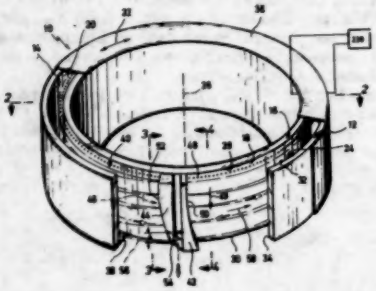
Hans Opower, Krailling, Fed. Rep. of Germany, assignor to Deutsche Forschungsanstalt fuer Luft- und Raumfahrt, Fed. Rep. of Germany

Filed Aug. 24, 1989, Ser. No. 399,029

Claims priority, application Fed. Rep. of Germany, Aug. 26, 1988, 3828951

Int. Cl.[5] H01S 3/08

U.S. Cl. 372—94 **29 Claims**



1. Waveguide configuration for a high-frequency-excited, diffusion-cooled gas laser system comprising a waveguide carrier with a cavity closed like a ring in an azimuthal direction in relation to a longitudinal axis and extending in the direction of said longitudinal axis, and a waveguide for guidance of a laser beam along an optical axis, said waveguide being arranged in said cavity and formed by waveguide wall surfaces disposed at a constant spacing from one another, the width of said waveguide wall surfaces transversely to the lengthwise extent of said waveguide in the direction of said optical axis being a multiple of their spacing from one another, and said waveguide wall surfaces enclosing a discharge space between them, characterized in that said waveguide (40, 83, 88, 114, 168) is arranged in said cavity such that its lengthwise extent (88, 90, 116, 170) includes an angle of ≤ 30 degrees with said azimuthal direction (22, 86, 118, 166).

4,961,202

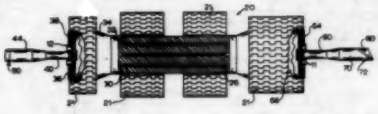
SINGLE LINE LASER AND METHOD

Edwin G. Chaffee, Salt Lake City, Utah, assignor to American Laser Corporation, Salt Lake City, Utah

Filed Aug. 18, 1989, Ser. No. 396,434

Int. Cl.[5] H01S 3/08

U.S. Cl. 372—100 **6 Claims**



1. A gas laser assembly, comprising:

(a) a gas confining structure formed of electrically insulating material defining an envelope containing an optically-radiating gas and within said envelope a plasma guide bore;

(b) a first tubular support member secured to one end of said structure and formed of electrically insulating material, said first support member defining a gas path extending from a first opening at one end of said envelope, said opening and the gas path within said first support member being axially aligned with said plasma guide bore, the outer end of said first tubular support being formed as a smoothly curved annular mounting surface in precisely defined orientation relative to the axis of said plasma guide bore;

(c) a first cylindrical optical mirror element having an inner concave coated mirror surface facing inwardly of said envelope and an outer convex coated mirror surface, a peripheral portion of said inner surface conforming to and being in direct contact with said smoothly curved: annular surface to thereby position said mirror surfaces in the same said precisely defined orientation relative to the axis of said plasma guide bore;

(d) a second tubular support member secured to an opposite end of said structure and formed of electrically insulating material, said second support member defining a second gas path extending from a second opening at an opposite end of said envelope, said opposite end opening and the second gas path within said second support member being axially aligned with said plasma guide bore, the outer end of said second tubular support being formed as a planar annular mounting surface with the plane of said planar surface being at Brewster's angle relative to the axis of said plasma guide bore; and

(e) a second half-Littrow prism element having a first planar circular uncoated surface facing inwardly of said envelope, a peripheral portion of said first planar surface conforming to and being in direct contact with said planar annular mounting surface to thereby position said first planar surface of said prism element at Brewster's angle relative to the axis of said plasma guide bore, said half-Littrow prism element having a second planar circular coated mirror surface on an outer end of said prism element residing in a plane perpendicular to the laser beam transmitted from said prism element first planar surface and adapted to selectively transmit the laser beam generated within said bore, said mirror and prism elements being operatively effective to generate a one hundred percent (100%) purity single line polarized radiation.

4,961,203
SIGNAL GENERATOR

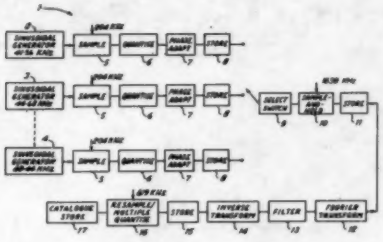
Barry G. Maufe, London, and Nicholas A. Young, Worcester, both of England, assignors to EMI Limited, Hayes, England

Continuation of Ser. No. 838,788, Mar. 12, 1986, abandoned. This application Sep. 20, 1989, Ser. No. 410,007

Claims priority, application United Kingdom, Mar. 15, 1985, 8506810

Int. Cl.[5] H04K *1/00*

U.S. Cl. 375—1 **5 Claims**



1. A spread-spectrum signal generator for producing a spread-spectrum bandwidth signal ranged between specified frequencies, the generator characterised by:

means to assimilate a plurality of individual waveforms into a series of signals of spread-spectrum bandwidth format and predetermined bit rate;

means to effect a Fourier transform, to the frequency domain, on signals derived by the assimilation means;

means to filter out, from the transform means output, those frequencies outside the specified range;

means to effect an inverse Fourier transform, to the time domain, on the output from the filter means;

means to effect sampling of the output of the inverse-transform means at a rate substantially greater than the bit rate of said series of signals of spread-spectrum bandwidth format; and

means to store a plurality of digital signals representative of series of the sampled signals, the storage means being effective to provide a source of spread-spectrum signals within the specified frequency rate.

4,961,204
PCM SIGNAL GENERATING/REPRODUCING APPARATUS

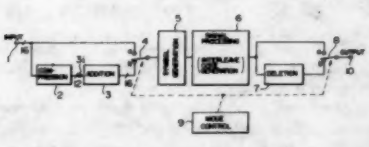
Hiromichi Tanaka, Ebina; Takao Arai, Yokohama; Toshifumi Takeuchi, Yokohama, and Seiichi Saito, Yokohama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed May 18, 1989, Ser. No. 353,709

Claims priority, application Japan, May 23, 1988, 63-123828; Jun. 22, 1988, 63-152294

Int. Cl.[5] H04B *14/04*

U.S. Cl. 375—25 **24 Claims**



1. A PCM signal generating apparatus for recording/transmitting a PCM signal comprising:

an input device for receiving, word by word, a first signal comprising a plurality of words that are composed of n bits per word and a second signal comprising a plurality of words that are composed of n′ bits per word, each of n and n′ being an integer;

a data addition circuit for adding fixed data composed of (n−n′) bits to every word of the second signal in order to generate a third signal;

first switch means connected to receive the first and third signals for selectively outputting one of the first and third signals, the first and third signals each comprising a plurality of words;

a symbol generation circuit for converting every word of the output of said first switch means into symbol data composed of m×l bits, m and l being integers and n being greater than l;

a signal processing circuit for performing at least one of interleave processing, error correction code generation processing, and synchronizing signal addition processing on the output of said symbol generation circuit in order to generate a first data frame;

a data deletion circuit for deleting fixed data composed of (n−n′) bits from the first data frame of said signal processing circuit in order to generate a second data frame; and

second switch means connected to receive the first data frame from said signal processing circuit and the second data frame from said data deletion circuit in order to select and output the first data frame when said first switch means outputs the first signal and in order to select and output the second data frame when said first switch means outputs the third signal.

4,961,205
INTERFACE CIRCUIT

Toshiharu Kuwaoka, Yokohama, Japan, assignor to Victor Company of Japan, Ltd., Japan

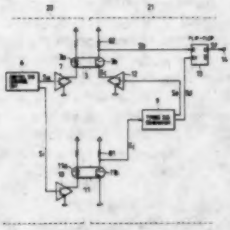
Continuation-in-part of Ser. No. 61,314, Jun. 11, 1987, Pat. No. 4,847,873. This application Sep. 6, 1988, Ser. No. 247,437

Claims priority, application Japan, Sep. 11, 1987, 62-227681

The portion of the term of this patent subsequent to Jul. 11, 2006, has been disclaimed.

Int. Cl.[5] H04B *3/00*

U.S. Cl. 375—36 **14 Claims**



1. An interface circuit for transmitting a digital data signal from a transmission unit to a reception unit, the interface circuit comprising:

(a) a photo coupling means optically connecting the transmission unit and the reception unit, the photo coupling means including a photo emitter and a photo receptor connected via an optical path, the photo emitter being disposed in the transmission unit and provided with the transmission digital data signal, said photo emitter generating an optical signal corresponding to the transmission digital data signal, the photo receptor being disposed in the reception unit and receiving the optical signal, the photo receptor being switched by short electrical pulses, the photo receptor sampling the optical signal and converting the sampled optical signal into a corresponding reception digital signal at moments of occurrences of the short electrical pulses;

(b) means for transmitting a sync signal from the transmis-

sion unit to the reception unit, the sync signal having a fixed timing relationship with the transmission digital data signal;

(c) pulse generating means, disposed in the reception unit, for generating the short electrical pulses on the basis of the sync signal and for synchronizing the short electrical pulses with the transmission digital data signal, and

(d) sync generating means disposed in the transmission unit for generating said sync signal, and a second photo coupling means optically connecting the transmission unit and the reception unit for transmitting said sync signal from the transmission unit to the reception unit.

4,961,206

DATA MODEM SYSTEM

Martin Tomlinson, The Coach House, Tristford House, Haberton, Totnes, Devon, England (TQ97RZ), and Jonathan R. Bramwell, 27 Keaton Road, Ivybridge, Devon, England

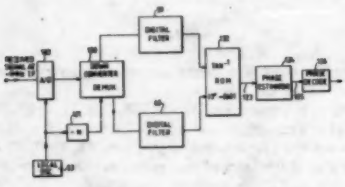
PCT No. PCT/GB85/00539, § 371 Date Sep. 19, 1986, § 102(e) Date Sep. 19, 1986, PCT Pub. No. WO86/03356, PCT Pub. Date Jun. 5, 1986

PCT Filed Nov. 22, 1985, Ser. No. 897,521

Claims priority, application United Kingdom, Nov. 22, 1984, 8429484; Mar. 8, 1985, 8506065

Int. Cl.[5] H04B *1/30*

U.S. Cl. 375—39 **31 Claims**



16. A method according to claim 15, wherein the corrected phase signal includes a residual phase error, and wherein the second phase signal is generated by removing information phase components from the corrected phase signal, to produce a residual phase error signal, adding the second phase signal to the residual phase error signal to produce a third phase signal representing the actual phase of the first phase signal, evaluating the third phase signal over a period of time to predict a subsequent value of the third phase signal, and using the predicted value for generating said second phase signal.

4,961,207

SYNCHRONIZATION OF DIGITAL SIGNALS WITH ALTERNATING CURRENT

Charles M. Wittmer, Trumbull, Conn., and Ronald J. Swanson, Pompton Lakes, N.J., assignors to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed Aug. 2, 1989, Ser. No. 389,150

Int. Cl.[5] H03L *5/00, 7/00*

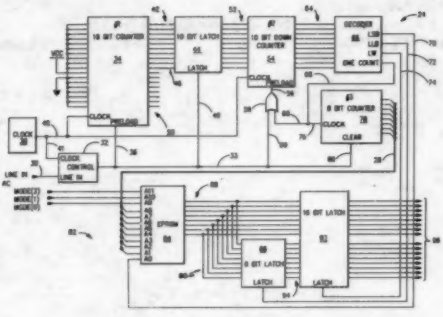
U.S. Cl. 377—43 **14 Claims**

1. A circuit for synchronizing digital signals with alternating current, comprising:

first counter means responsive to a predetermined phase point in each line cycle of an alternating current, for repetitively starting a first counting sequence at the predetermined phase point and effecting the first counting sequence at a high frequency rate relative to the alternating current, thereby generating a total count during each line cycle;

dividing means receptive of the total count for dividing the total count by a dividing integer to produce a count number;

second counter means responsive to the predetermined phase point for repetitively starting a second counting sequence at the predetermined phase point, and further responsive to the count number for effecting the second counting sequence at the high frequency rate so as to count to the count number continuously during each line cycle; and



decoder means responsive to the second counter for producing a digital output signal at a predetermined point in a preselected second counting sequence during each line cycle, whereby the digital output signal and the alternating current are in a predetermined phase relationship.

4,961,208

COMPUTED TOMOGRAPHY APPARATUS

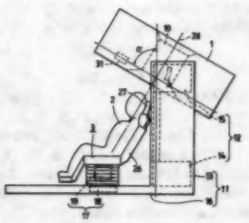
Hiroyuki Okada, Sizuoka, Japan, assignor to Hamamatsu Photonics K. K., Shizuoka, Japan

Filed Feb. 6, 1990, Ser. No. 475,878

Claims priority, application Japan, Feb. 7, 1989, 1-28231

Int. Cl.[5] G01N *23/00*

U.S. Cl. 378—17 **7 Claims**



1. A computed tomography apparatus in which a gantry and a subject holder are supported on a main frame, said apparatus comprising:

gantry drive means for moving said gantry to a position of examination, and driving said gantry until an inclination angle for examination is reached;

computing means for performing mathematical operations based on data representing said inclination angle of said gantry set by said gantry drive means, and producing a control signal for controlling a holder moving direction which is determined in accordance with said inclination angle; and

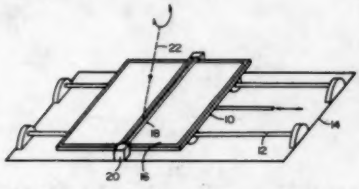
moving means for moving said holder in said holder moving direction in response to said control signal from said computing means.

4,961,209

SYSTEM FOR MEASURING THE CHARGE DISTRIBUTION ON A PHOTORECEPTOR SURFACE

John A. Rowlands, Toronto; Naoum Araj, Montreal, and Herbert J. Davis, Beaconsfield, all of Canada, assignors to Noranda, Inc., Toronto, Canada

Filed Nov. 30, 1988, Ser. No. 278,274
Claims priority, application Canada, Dec. 1, 1987, 553214
Int. Cl.[5] G03G 15/044
U.S. Cl. 378—29 6 Claims



1. A system for measuring the surface charge distribution on a photoreceptor plate which has been exposed to X-ray radiation to form an image of an object thereon, said system comprising:

(a) a transparent sensor electrode and means for positioning the electrodes over the photoreceptor plate;

(b) means for scanning a pulsed laser beam through the transparent sensor electrode to discharge the photoreceptor plate surface charge pixel-by-pixel and so induce a corresponding voltage on the sensor electrode to be read by a read-out device, said sensor electrode being of sufficient width so as to achieve good capacitive coupling with the region around the area to be discharged by the laser; and

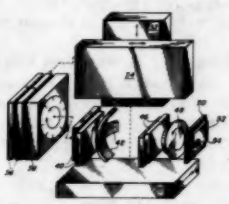
(c) means for moving one of the sensor electrode and the photoreceptor plate in one of a step by step transverse movement and continuous transverse movement of the laser scanning direction for reading out the image impressed on the photoreceptor surface.

4,961,210

HIGH RESOLUTION TECHNIQUE AND INSTRUMENT FOR MEASURING LATTICE PARAMETERS IN SINGLE CRYSTALS

Mohammad Fatemi, McLean, Va., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 28, 1990, Ser. No. 486,324
Int. Cl.[5] G01N 23/207, 23/203, 23/201
U.S. Cl. 378—73 7 Claims



1. A method of measuring the lattice parameter in an unknown single crystal by comparing said unknown single crystal's diffraction angle to a standard single crystal, on a double-crystal diffractometer, which method comprises the steps of:

mounting said unknown and standard crystals on a mounting block of the second stage of a double-crystal diffractometer such that a tilt axis of the crystal surface is in line with an x-ray beam and the azimuth axis of the second stage crystal mount;

rotating the mounting block until the normals of said crystals have equal vertical components;

tilting the crystals about the azimuth axis of the mounting block until the crystal normals lie in the horizontal plane in line with the x-ray beam, such that the same point on the crystal surface remains fixed in the x-ray beam;

sequentially measuring the angle of the sharpest diffraction peak from each crystal while moving the crystals laterally across the beam;

rotating the mounting block assembly by 180 degrees about the azimuth axis while maintaining the relative tilt between the two wafers, such that the same area of the crystal surface remains in the x-ray beam during the 180 degrees rotation;

sequentially measuring the angle of sharpest diffraction peak of both crystals after rotation which point of measurement is the same as the first sequential measurement; and

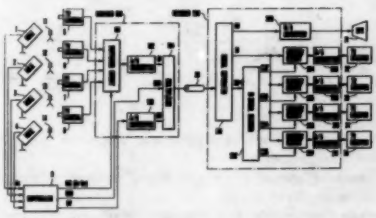
calculating the diffraction angle of the unknown crystal from the standard crystal diffraction angle by using the diffraction angles measured before and after rotation by 180 degrees, thereby removing any misorientation between the respective crystal normals in the horizontal plane.

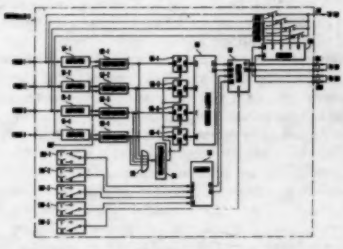
4,961,211

TELEVISION CONFERENCE SYSTEM INCLUDING MANY TELEVISION MONITORS AND METHOD FOR CONTROLLING THE SAME

Shuzo Tsugane, and Tooru Yasuda, both of Tokyo, Japan, assignors to NEC Corporation, Japan

Filed Jun. 30, 1988, Ser. No. 213,327
Claims priority, application Japan, Jun. 30, 1987, 62-161341
Int. Cl.[5] H04M 11/00; H04N 7/14
U.S. Cl. 379—54 12 Claims





8. A system for providing television conferencing from a transmit side to a receive side, the transmit side including a plurality of associated microphone-TV camera pairs, the microphones being for producing speaker-voice signals and the TV cameras being for producing speaker-moving picture sig-

nals, the receive side including a loudspeaker for broadcasting a selected one of the speaker-voice signals and a plurality of TV monitors for respectively displaying selected ones of either the speaker-moving picture signals or a still frame of such signals, each of the TV cameras and The TV monitors having a respective ID, the transmit and receive sides being interconnected by a transmission link, the system further comprising:

selection means for both predetermining according to ID a respective TV monitor for displaying a speaker-moving picture signal and a TV camera whose speaker-moving picture signal is to be transferred to the respective TV monitor via the transmission link;

the selection means including an automatic selection means and override means for overriding the automatic selection means, the override means comprising a manual selection means for manually selecting a microphone whose associated TV camera is thereby selected, the manual selection means including a manual mode-selection switch the manual selection means being effective for selecting a speaker regardless of a priority order.

4,961,212

VOICE RECOGNITION SYSTEM USED IN TELEPHONE APPARATUS

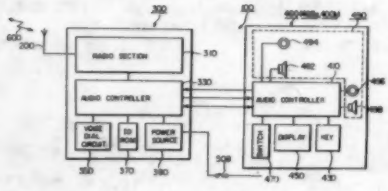
Kuniyoshi Marui, Tokorozawa; Takaaki Ishii, Sagamihara, and Shinya Takahashi, Hino, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kanagawa, Japan

Continuation of Ser. No. 198,821, May 25, 1988, abandoned. This application Nov. 3, 1989, Ser. No. 432,312

Claims priority, application Japan, May 29, 1987, 62-133906; Jul. 20, 1987, 62-180833

Int. Cl.[5] H04M *1/272, 1/64, 11/00*

U.S. Cl. 379—67 **2 Claims**



1. A telephone apparatus having a voice activated dialing function, comprising:

transmitting means for transmitting at least a single telephone number;

receiving means for receiving incoming calls;

input means for inputting at least a single telephone number, bank designation inputs, mode designation inputs, and speech signals representing at least one user's utterance;

memory means coupled to the input means for storing the at least single telephone number and the speech signals; and

control means responsive to the inputs from the input means for controlling the transmitting means and the memory means in one of a plurality of operational modes designated by the mode designation inputs, including:

(a) a registration mode in which the control means controls the memory means so that a speech signal corresponding to a user's utterance is stored with a corresponding telephone number into a bank area of the memory means designated by the bank designation inputs, and controls the receiving means so that the apparatus does not respond to an incoming call received by the receiving means;

(b) a voice dialing mode in which, in response to a user's utterance, the control means controls the memory means so as to retrieve a telephone number corresponding to the stored speech signal which is identical to a speech signal corresponding to the user's utterance and stored in a bank area of the memory means designated by the bank designation input and, in the event that the telephone number is retrieved, controls the transmitting means so as to transmit the retrieved telephone number; and

(c) a standby mode in which the apparatus responds to incoming call and user's operations, a transition from the standby mode to one of the voice dialing mode or the registration mode being made in response to the mode designation input.

4,961,213

X-RAY APPARATUS COMPRISING A FILM CASSETTE WHICH IS DISPLACEABLE IN A CARRIAGE

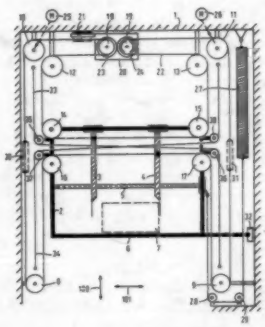
Claud H. Linhart, Hamburg, Fed. Rep. of Germany, assignor to U. S. Philips Corporation, New York, N.Y.

Filed Feb. 22, 1989, Ser. No. 314,014

Claims priority, application Fed. Rep. of Germany, Feb. 22, 1988, 3805409

Int. Cl.[5] G03B *42/02*

U.S. Cl. 378—181 **18 Claims**



1. In an X-ray apparatus, the combination comprising:

a support,

a carriage for a film cassette displaceable in a load direction,

a cassette clamp device for positioning the cassette perpendicularly to the load direction,

a plurality of pairs of guide rollers offset with respect to one another in the load direction on the support and on the carriage,

independently controlled motor drives which act on the clamp device via an endless loop traction means set forth guided via the rollers, the traction means sections between the rollers on the carriage being parallel to one another and between the rollers on the support being parallel to one another, and

the endless loop traction means forming a closed loop which is movable relative to said support throughout the loop guided from one roller of a roller pair mounted on the support to the other roller of the pair via one of the pairs of rollers on the carriage, the loop being coupled to the clamp device for fixing the cassette position, two motor drives acting on the traction means via the rollers on the support, between said rollers on said support there being situated at least one roller which is not secured to the support.

4,961,214
X-RAY EXAMINATION APPARATUS COMPRISING A BALANCED SUPPORTING ARM

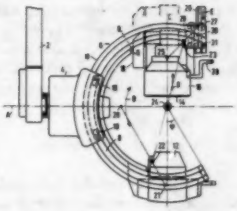
Johannes G. Van Endschot, and Adrianus A. J. Van Der Vegt, both of Eindhoven, Netherlands, assignors to U. S. Philips Corporation, New York, N.Y.

Filed Jun. 22, 1989, Ser. No. 370,213

Claims priority, application Netherlands, Jul. 11, 1988, 8801750

Int. Cl.[5] H05G 1/02

U.S. Cl. 378—197 **7 Claims**



1. An X-ray examination apparatus including a column, a sleeve connected to the column and rotatable about a first horizontal axis, a C-shaped support movably secured to the sleeve for rotation about a second axis which intersects the first axis at right angles, said sleeve having a center of gravity offset from said first and second axes, an X-ray source secured to the support at a first support end and an X-ray detector secured to the support at a second support end, the X-ray detector being movable along a central ray of an X-ray beam emitted by the source, the combination therewith comprising:

a counterweight movably secured to said second end;

means for coupling the counterweight to said detector such that a shift in the center of gravity of the X-ray detector upon displacement of the detector shifts the position of the counterweight; and

means for compensating for the shift in center of gravity of the detector including means for positioning the combined center of gravity of the support, X-ray source, X-ray detector and counterweight on the second axis over an adjustable range of distances of the detector relative to the source and for positioning the combined center of gravity of the sleeve, support, X-ray detector, X-ray source and counterweight on the first axis over said adjustable range of distances.

4,961,215
CONTINUOUS RADIO ANNOUNCER

Robert Fernandez, Hialeah Gardens, and Jesus Sanchelima, Miami, both of Fla., assignors to F.M.R. Devices, Inc., Hialeah Gardens, Fla.

Filed Dec. 9, 1988, Ser. No. 281,620

Int. Cl.[5] H04M 11/08

U.S. Cl. 379—56 **5 Claims**

1. A continuous radio announcer, comprising:

A. first means for recording and reproducing sound messages having an output and including first random access memory means for storing said sound messages in digitized format;

B. transmitter means connected to said output for transmitting said sound messages;

C. receiver means tunable to said transmitter means' frequency;

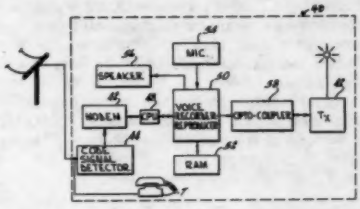
D. first modem means connected to said first sound recording and reproducing means;

E. a telephone network connected to said first modem means;

F. second means for recording and reproducing sound messages having second random access memory means for storing said sound messages;

G. second modem means connected to said second sound recording and reproducing means and to said telephone network;

H. first microprocessor means for assembling and transmitting the information in said first random access memory means and being connected to said first sound recording and reproducing means and to said first modem means; and



sound recording and reproducing means and to said first modem means; and

I. second microprocessor means connected to said second sound recording and reproducing means so that the information recorded in said first and second random access means can be exchanged through said first and second modem means and through said first and second sound recording and reproducing means.

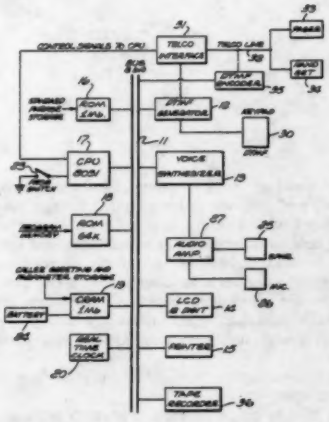
4,961,216
TELEPHONE ANSWERING AND PAGING SYSTEM

G. Geoffrey Baehr, 23800 Hawthorne Blvd., Torrance, Calif. 90505, and Bert P. Rosenthal, 2001 Santa Monica Blvd., Suite 685W., Santa Monica, Calif. 90404

Filed Dec. 30, 1988, Ser. No. 292,221

Int. Cl.[5] H04M 1/65, 3/50

U.S. Cl. 379—57 **14 Claims**



1. In a telephone answering system for connection to a telephone line for operation between a telephone system customer and a pager for receiving calls from a caller through the telephone system and forwarding caller information to an owner through the telephone system and the pager, the combination of:

a telephone unit for connection to said telephone line, including means for automatically answering a call on the line and automatically placing a call on the line;

a message storage unit;

a message generation unit;

connection means for connecting said telephone unit to said message storage unit for storing an outgoing message from the owner to a caller, and for connecting said message generation unit to said telephone unit for placing outgoing messages on the telephone line to a caller through said telephone system and outgoing messages on the telephone line to the owner through said pager; and

control means for said connection means for automatically and sequentially transmitting an outgoing voice message as instructions to a caller, storing the caller's message, and transmitting the caller's message to said telephone line for transmission to the owner through said pager;

said message storage unit including means for storing an outgoing message to the caller in the form of a menu of possible items for selection by the caller, and means for storing the caller'telephone number and menu selection in digital form as transmitted by the caller by DTMF tones for subsequent transmission to the owner through said pager.

4,961,217

PERSONAL-SERVICING COMMUNICATION SYSTEM

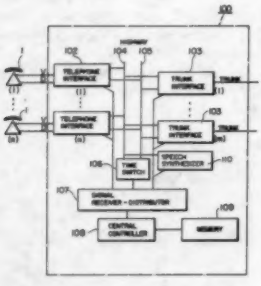
Tadahiko Akiyama, Koriyama, Japan, assignor to Hitachi Telecom Technologied, Ltd., Fukushima, Japan

Continuation of Ser. No. 669,797, Nov. 9, 1984, Pat. No. 4,759,056. This application Mar. 25, 1988, Ser. No. 173,673

Claims priority, application Japan, Nov. 11, 1983, 58-210928; Nov. 11, 1983, 58-210930; Nov. 11, 1983, 58-210931; Nov. 11, 1983, 58-210933

Int. Cl.[5] H04M *1/57, 11/00;* **H04Q** *3/72*

U.S. Cl. 379—89 **4 Claims**



1. A personal-servicing communication system, comprising:

a plurality of communication terminal devices, an exchange facility having a central controller responsive to connection control information received from said communication terminal devices for selectively interconnecting said communication terminal devices, and a portable memory device for memorizing personal information including a bearer's identification information, wherein,

(a) each of said plurality of communication terminal devices having:

means for reading out personal information from said portable memory device;

means for detecting whether said portable memory device is set in said reading out means;

means for transferring information to indicate that said portable memory device is not yet set when said portable memory device is not set in said reading out means;

means for transferring personal information including the bearer's identification information to said exchange facility; and

means for visually indicating character code information sent from said exchange facility; and

(b) said exchange facility having:

means for converting the identification information received from a calling communication terminal device to character code information indicating a calling subscriber's name;

means for transmitting said character code information to a called communication terminal device on the basis of the connection control information received from said calling communication terminal device; and

means for connecting a call without sending character code information when receiving information that said portable memory device is not yet set.

3. A personal-servicing communication system, comprising:

a plurality of communication terminal devices, an exchange facility having a central controller responsive to connection control information received from said communication terminal devices for selectively interconnecting said communication terminal devices, and a portable memory device for memorizing personal information including at least one of an identification code and character-coded name information of the bearer on a memory device, wherein,

(a) each of said plurality of communication terminal devices has:

means for reading out the identification code or character-coded name information of the bearer memorized in said portable memory device;

means for detecting whether said portable memory device is set in said reading out means;

means for transferring information to indicate that said portable memory device is not yet set when said portable memory device is not set in said reading out means;

means for transferring the personal information to said exchange facility; and

means for producing an audible signal of speech synthesized information of a calling person's name sent from said exchange facility;

(b) said exchange facility having:

means for responding to connection control information and at least one of an identification code or character-coded name information of the bearer received from a calling communication terminal device and offering personal communication service to said calling communication terminal device under the control of the central controller;

means for converting the identification code or character-coded name information of the bearer received from said calling communication terminal device to speech synthesized information of the calling person's name;

means for transmitting a speech synthesized information to a called communication terminal device; and

means for connecting a call without sending speech synthesized information when receiving information that said portable memory device is not yet set;

whereby when said portable memory device is set in the calling communication terminal device, the name of the calling person is announced from said called communication terminal device before the called person replies.

4,961,218

ENHANCED LINE POWERED AMPLIFIER

Frederick J. Kiko, Carlsbad, Calif., assignor to Tollgrade Communications, Inc., Erie, Pa.

Filed May 17, 1989, Ser. No. 352,863

Int. Cl.[5] H04B *3/36*

U.S. Cl. 379—347 **12 Claims**

1. An enhanced amplifier for interconnecting a two-wire, bidirectional cable side transmission path and a two-wire, bidirectional equipment side transmission path in a communication system, said line powered amplifier comprising:

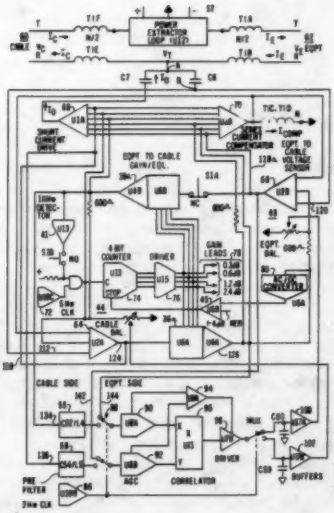
first hybrid splitter means coupled to receive first signals originating from the cable side transmission path and arriving at a cable side port for amplifying and transmitting said first signals to the equipment side transmission path via an equipment side port;

second hybrid splitter means coupled to receive second

signals originating from the equipment side transmission path and arriving at the equipment side port for amplifying and transmitting said second signals to the cable side transmission path via the cable side port;

said first splitter means including cable-to-equipment voltage sense amplifier means, shunt current driver means, and series current compensator means, said cable-to-equipment sense amplifier means being coupled to said cable side port for generating a cable side voltage, said shunt driver means and said series current compensator means being responsive to said cable side voltages for generating a first current which is passed to said cable side transmission path to provide a first simulated terminating impedance;

said second splitter means including equipment-to-cable voltage sense amplifier means, said shunt current driver means, and said series current compensator means, said equipment-to-cable voltage sense amplifier means being coupled to said equipment side port for generating an equipment side voltage, said shunt driver means and said series current compensator means being responsive to said



equipment side voltage for generating a second current which is passed to said equipment side transmission path to provide a second simulated terminating impedance;

cable-to-equipment gain/equalizer circuit means being also responsive to said cable side voltage for generating a cable-to-equipment gain control voltage, said shunt driver means and said series current compensator means being responsive to said cable-to-equipment gain control voltage for generating an amplified cable-to-equipment signal to said equipment side port;

equipment-to-cable gain/equalizer circuit means being also responsive to said equipment side voltage for generating an equipment-to-cable gain control voltage, said shunt driver means and said series current compensator means being responsive to said equipment-to-cable gain control voltage for generating an amplified equipment-to-cable signal to said cable side port; and

equipment side balance network means being also responsive to said cable side voltage for preventing said first signals originating from the cable side transmission path and sensed by said equipment-to-cable sense amplifier means from being returned to said cable side port.

4,961,219

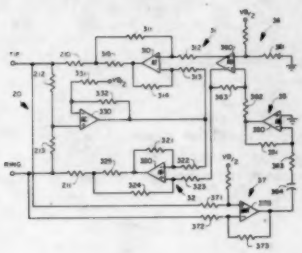
CIRCUIT FOR SYNTHESIZING AN IMPEDANCE ACROSS THE TIP AND RING LEADS OF A TELEPHONE LINE CIRCUIT

Lalit O. Patel, Mesa, Ariz., assignor to AG Communication Systems Corporation, Phoenix, Ariz.

Filed Dec. 4, 1989, Ser. No. 445,827

Int. Cl.[5] H04M *1/76*

U.S. Cl. 379—398 **8 Claims**



1. A circuit for synthesizing an input impedance across the tip and ring leads of a subscriber loop, said circuit comprising:

tip drive means connected to the tip lead of a subscriber loop arranged to convert feed voltage from a central office battery to tip feed current on said subscriber loop;

ring drive means connected to the ring lead of a subscriber loop arranged to convert feed voltage from a central office battery to ring feed current on said subscriber loop;

differential sensing means connected to said subscriber loop for detecting a difference in voltage level between said tip lead and said ring lead and arranged to develop a single ended output signal of a specific gain;

feedback means connected to said differential sensing means via a resistance and capacitance network, said feedback means receiving said differential sensing means output and in combination with said resistance and capacitive network developing a pair of impedance output signals of equal amplitude, each impedance output signal of said pair of impedance output signals connected to a respective one of said tip drive and said ring drive means, whereby, an input impedance equal to the impedance of said subscriber loop is derived at said tip leads and said ring leads.

4,961,220

POWER MANAGEMENT IN A MICROPROCESSOR-CONTROLLED BATTERY-POWERED TELEPHONE DEVICE

Michael L. Tentler, and Michael L. Hightower, both of San Diego, Calif., assignors to Spectrum Concepts, Inc., New York, N.Y.

Filed Dec. 21, 1988, Ser. No. 290,304

Int. Cl.[5] H04M *19/00*

U.S. Cl. 379—413 **42 Claims**

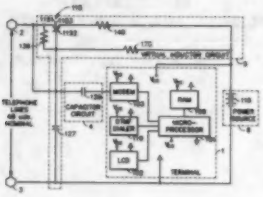
1. An electrical circuit for powering a telephone device that (i) receives alternating current communications signals from telephone lines and that (ii) sinks direct current from the same telephone lines in order to provide an off-hook signal, the circuit comprising:

a capacitor means for connecting an alternating current communication signal from telephone lines to a telephone device while blocking any flow of direct current from the telephone lines to the telephone device;

a fixed voltage power source means connected in electrical parallel across the telephone device for powering the telephone device with direct current; and

a virtual inductor means connected in electrical series between the telephone lines and the parallel-connected power source means and telephone device for sinking

direct current from the telephone lines to the parallel-connected power source means and telephone device in order



to provide an off-hook signal while blocking any flow of alternating current to the parallel-connected power source means and telephone device.

4,961,221

COMMUNICATION METHOD AND SYSTEM WITH ENCRYPTION OF INFORMATION

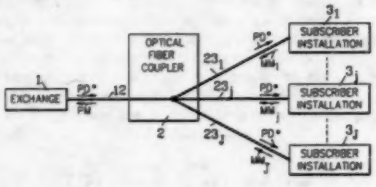
Jacques Abiven, Plouaret, France, assignor to L'Etat Francais represente par le Ministre des Poste, Telecommunications et de l'Espace (Centre National d'Etudes des Telecommunications, Issy-les-Moulineaux, France

Filed Dec. 12, 1989, Ser. No. 449,218

Claims priority, application France, Dec. 14, 1988, 88 16467

Int. Cl.[5] H04K *1/06;* **H04T** *3/00;* **H04L** *5/14;* **H04B** *9/00*

U.S. Cl. 380—21 **5 Claims**



1. A method for encrypting information in a communication system in which bidirectional multiplexed communications of the point-to-multipoint type are derived between a central station and plural terminal stations, said central station transmitting first multiplexed words respectively destined for said terminal stations, and said terminal stations respectively supplying second words which are multiplexed and transmitted towards said central station, said method comprising

in said central station, detecting transmission errors in said second words thereby deriving transmission error informations and transmitting them towards said terminal stations, and encrypting first words respectively as a function of corresponding second words free of transmission error, previously received in said central station, and

in said terminal stations, detecting said transmission error informations, memorizing temporarily said second words that are transmitted from said terminal stations and received free of transmission error, and decrypting said first words respectively received in said corresponding terminal stations as a function of the detected transmission error informations and the memorized second words.

4,961,222

APPARATUS IN A TELECOMMUNICATION SYSTEM FOR SUPPLYING POWER TO A TELEPHONE SET

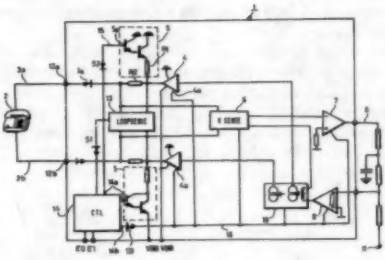
Hans V. Johansson, Bergshamra, and Arne O. T. Rydin, Saltsjöbaden, both of Sweden, assignors to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden

Continuation of Ser. No. 143,165, Dec. 31, 1987, abandoned. This application Aug. 10, 1989, Ser. No. 393,007

Claims priority, application Sweden, May 6, 1986, 8602080

Int. Cl.[5] H04M *3/40, 19/08*

U.S. Cl. 379—413 **2 Claims**



1. Apparatus in a telecommunication system for supplying power to a telephone set, said apparatus including a line circuit with speech signal amplifiers, which are connected via a subscriber line to the telephone set and a power source connected to the speech signal amplifiers, wherein the line circuit has auxiliary amplifiers, separate and apart from said speech signal amplifiers, connected to the subscriber line and to said power source, a loop sensing circuit connected to the subscriber line and a control circuit connected to the loop sensing circuit and to control inputs of the speech signal amplifiers and the auxiliary amplifiers and, when the receiver of the telephone set is in its lifted-off position, the loop sensing circuit senses this position and sends a corresponding signal to the control circuit which, by control signals, enables the speech signal amplifiers and disables the auxiliary amplifiers, causing the auxiliary amplifiers to present an open circuit to said subscriber line, and in that when the receiver is in its cradled position, the loop sensing circuit senses this position and sends a corresponding signal to the control circuit which, by the control signals disables the speech signals amplifiers and enables the auxiliary amplifiers so that the speech signal amplifiers, which require power, only supply power to the telephone set when the receiver is off its cradle and a call can be made.

4,961,223

SHOULDER REST FOR CELLULAR-TELEPHONE HANDSET

Bernard S. Sutton, P.O. Box 022550, New York, N.Y. 11202-0053

Filed Apr. 7, 1989, Ser. No. 334,688

Int. Cl.[5] H04M *1/00*

U.S. Cl. 379—449 **1 Claim**

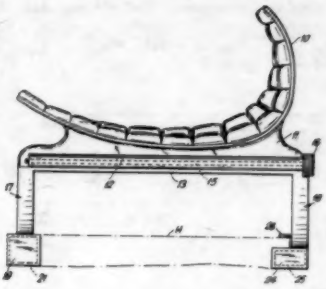
1. In combination with a cellular telephone handset having a forwardly directed mouthpiece, a forwardly directed earpiece spaced therefrom, and a relatively thick shank extending therebetween, the shank having a back face provided with control buttons, a shoulder rest comprising:

a contoured cradle for mounting the handset on a user's shoulder, the cradle comprising a contoured stiff elongated base and a cushioned material mounted on the base, the cushioned material arranged to abut comfortably the user's shoulder.

A stem projecting upwardly from the cradle and having an upper end provided with a pivot comprising a split cylin-

der arranged along the base and adapted to receive a bearing whereby the bearing can move angularly relative to the split cylinder, and locking means for locking the bearing relative to the split cylinder;

a holder body connected fixedly to the bearing and including a pair of V-shaped clips opening away from the cradle



and spaced apart on the holder and each having a pair of arms adapted to embrace a respective end of the handset across the back face of the stem;

respective tightening elements bridging the arms and operable to close the clips on edges of the handset, each tightening element including a screw extending from one arm to the other.

4,961,224

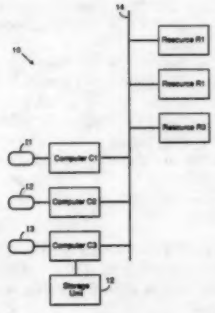
CONTROLLING ACCESS TO NETWORK RESOURCES

Darby Yung, 1 Richmond Street West, Toronto, Ontario, Canada (M5H 1Y8)

Filed Mar. 6, 1989, Ser. No. 319,277

Int. Cl.[5] H04L *9/32, 12/22*

U.S. Cl. 380—25 **28 Claims**



1. A network, comprising:

a plurality of computing devices;

a plurality of resources;

storage means containing data defining an access log;

a communications channel permitting each computing device to access each of the resources and the storage means for data transfer;

each computing device being adapted to access a required one of the resources according to a resource accessing procedure comprising;

a. recording an entry in the access log identifying the required resource prior to any accessing of the required resource;

b. scanning the access log prior to any accessing of the required resource to locate any conflicting entry identifying the required resource;

c. terminating the resource accessing procedure in response to any conflicting entry located during the scanning of the access log;

d. accessing the required resource in response to the absence of any conflicting entry in the access log;

e. deleting the recorded entry when any accessing of the required resource by the computing device is finished.

4,961,225

FUZZY DATA COMMUNICATION SYSTEM

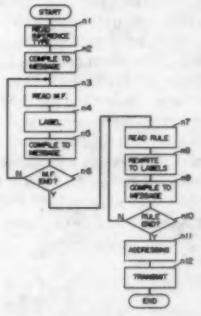
Atsushi Hisano, Nagaokakyo, Japan, assignor to Omron Tateisi Electronics Co., Kyoto, Japan

Filed Sep. 27, 1989, Ser. No. 413,097

Claims priority, application Japan, Sep. 29, 1988, 63-244968

Int. Cl.[5] H04K *1/00;* **G06G** *7/00*

U.S. Cl. 380—28 **7 Claims**



1. A fuzzy data communication system comprising first inference means for implementing a first fuzzy inference,

second inference means for implementing a second fuzzy inference, and

communication means for transmitting fuzzy data employed in said first inference means into said second inference means to be employed by the second inference means.

4,961,226

STEREO ELECTROACOUSTICAL TRANSDUCING

Richard E. Saffran, Boston, Mass., assignor to Bose Corporation, Framingham, Mass.

Filed Nov. 30, 1987, Ser. No. 126,624

Int. Cl.[5] H04R *5/02*

U.S. Cl. 381—24 **17 Claims**

1. Stereo electroacoustical transducing apparatus comprising,

left and right loudspeaker cabinets each having an input terminal pair,

each of said loudspeaker cabinets being substantially the mirror image of the other and having at least a rear panel and a side panel for normally facing front and side walls of a listening room and a front panel for normally facing the listening area of a room,

for each of said loudspeaker cabinets one of said rear and side panels supporting a first woofer means for radiating low frequency energy and comprising first driver means for radiating acoustical energy having spectral compo-

nents restricted to being below approximately 100 Hz to 3 Hz,

each front panel supporting a second woofer means for radiating low frequency energy and a tweeter means for radiating high frequency energy,

said second woofer means and said tweeter means comprising second driver means for radiating acoustical energy having spectral components in both the midrange from approximately 100 Hz to 3 kHz and in the treble frequency range having spectral components above 3 kHz,

means for coupling said first woofer means and said second woofer means to said input terminal pair so that said first and second woofer means radiate acoustical energy in phase,

and high pass filtering means for coupling said input terminal pair to said tweeter means so that acoustical energy radiated from said one of said side and rear panels is restricted to energy having spectral components below approximately 3 kHz while acoustical energy radiated from said front panel includes spectral components within the midrange from about 100 Hz to 3 kHz and in the treble frequency range above approximately 3 kHz,

said first and second driver means, said front, rear and side panels and said high pass filtering means coacting to establish a radiation pattern having a maximum in the midrange away from the area between the left and right loudspeaker cabinets and toward an adjacent side wall and a maximum in the treble range directed toward said area between the left and right loudspeaker cabinets.

4,961,227

PORTABLE LOUD SPEAKER SYSTEM

Robert D. Le Donne, 9707 Ross Station Rd., Sebastopol, Calif. 95472

Filed Sep. 28, 1989, Ser. No. 414,126
Int. Cl.[5] H04R 5/02
U.S. Cl. 381—24 **21 Claims**

1. A speaker having a speaker housing which vibrates in harmony with the audible sounds created by the speaker, the speaker comprising:

a loud speaker housing having a vibratable surface;

a speaker cone which vibrates within said housing to generate audible sound during said speaker's operation;

a propagation member having a first contact surface in contact with said speaker cone, and a second contact surface in contact with said vibratable surface of said speaker housing,

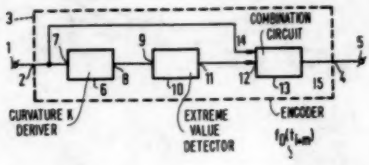
said member propagating said cone vibrations to said vibratable surface causing vibratable surface to vibrate in harmony with the audible sounds created by the speaker.

4,961,228

METHOD OF AND DEVICE FOR ENCODING A SIGNAL, FOR EXAMPLE A SPEECH PARAMETER SUCH AS THE PITCH, AS A FUNCTION OF TIME

Dirk J. Hermes, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 14, 1989, Ser. No. 323,469
Claims priority, application Netherlands, Apr. 5, 1988, 8800854
Int. Cl.[5] G10L 7/02
U.S. Cl. 381—41 **10 Claims**



3. A device for encoding a first signal which varies as a function of time comprising: an input terminal for receiving the first signal which comprises a plurality of signal samples, an encoding unit having an input coupled to the input terminal and having an output, said encoding unit being constructed to encode the first signal to form a second signal comprising a sequence of successive information blocks, an information block containing time information corresponding to a specific time instant and containing amplitude information related to the first signal and which corresponds to said specific time instant, the second signal appearing at said output, wherein the encoding unit comprises

means for deriving from the first signal a third signal which is a measure of the curvature of the first signal as a function of time and for determining extrema in said third signal thereby to generate said second signal wherein an information block contains time information corresponding to an instant at which an extremum occurs in the third signal,

characterized in that said means for deriving the third signal determines, for each of a number of instants at which a sample of the first signal is available, two lines intersecting one another at said instant and extending through a plurality of samples of the first signal at instants within a time interval within which said instant is situated, and determines the angle between said two intersecting lines.

4,961,229

SPEECH RECOGNITION SYSTEM UTILIZING IC CARDS FOR STORING UNIQUE VOICE PATTERNS

Tsutomu Takahashi, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Continuation of Ser. No. 911,146, Sep. 24, 1986, abandoned. This application Jul. 21, 1989, Ser. No. 383,255
Claims priority, application Japan, Sep. 24, 1985, 60-208721
Int. Cl.[5] G10L 5/06
U.S. Cl. 381—42 **2 Claims**

1. A speech recognition system for identifying a person by his voice, comprising:

an IC card carried by a person, for storing only his voice pattern;

means for reading out said voice pattern from said IC card;

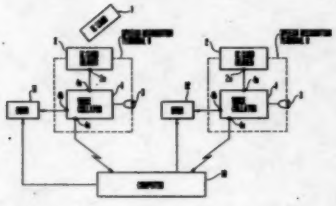
means for extracting an actual voice pattern of said person carrying said IC card; and

means for collating said voice pattern read out from said IC card with said actual voice pattern from said voice pattern extracting means;

wherein said actual voice pattern extracting means comprises a microphone, an A/D converter for converting a

voice signal input at said microphone into a digital signal, and an analyzing means for analyzing an output signal from said A/D converter and detecting a voice pattern identification parameter;

said speech recognition system further comprising:



writing means for writing in said IC card an analysis result of said analyzing means which represents a result of the voice signal input at said microphone from said analyzing means, said writing replacing an old voice pattern stored in said IC card with a new voice pattern.

4,961,230

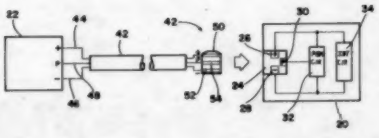
HEARING AID PROGRAMMING INTERFACE

Rolf C. Rising, Kungbacka, Sweden, assignor to Diaphon Development AB, Molndal, Sweden

Filed May 10, 1988, Ser. No. 192,242

Int. Cl.[5] H04R *25/02*

U.S. Cl. 381—69.2 **10 Claims**



1. A programmable hearing aid energizable by electrical connection to a battery comprising:

a battery compartment having two battery terminals for contacting the positive and negative terminals of the battery, said battery terminals electrically coupled to circuitry in the programmable hearing aid; and

a programming terminal coupled to programming circuitry in the programmable hearing aid device, said programming terminal being located in said battery compartment;

said battery compartment and programming terminal being physically arranged such that said programmable terminal is utilizable only when said battery is removed from said battery compartment.

9. A method for programming a programmable hearing aid energized by a battery retained in a battery compartment in the hearing aid by electrical contact with an external hearing aid programming system, the method comprising:

locating a programming terminal in electrical contact with programming circuitry in the hearing aid in the battery compartment;

removing the battery retained in the battery compartment;

then inserting a coupling member having a programming electrode mounted thereon in said battery compartment, and electrically coupling said programming electrode with the external hearing aid programming system and with said programming terminal in the battery compartment.

4,961,231

PATTERN RECOGNITION METHOD

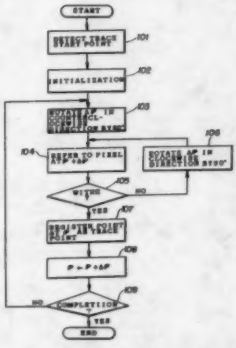
Hiroshi Nakayama, Yokohama; Keiji Kojima, Kawasaki, and Gen Sato, Yokohama, all of Japan, assignors to Ricoh Company, Ltd., Japan

Filed Dec. 31, 1987, Ser. No. 140,131

Claims priority, application Japan, Jan. 20, 1987, 62-10879; Jan. 30, 1987, 62-20289; Mar. 9, 1987, 62-53290

Int. Cl.[5] G06K *9/48*

U.S. Cl. 382—21 **31 Claims**



1. A pattern recognition method comprising the steps of:

detecting a first change in type between two consecutive pixels in a direction of a raster-scan which is carried out for a binary image of an unknown pattern, one of said two consecutive pixels being designated as a start point from which a trace of a contour of said binary image starts;

tracing said contour of said binary image in a predetermined direction along a predetermined type of pixels in such a way that four adjacent pixels on upper, lower, left-hand and right-hand sides of a point of interest are checked in a direction starting from one pixel out of said four adjacent pixels which is positioned on a predetermined side at an angle of 90 degrees with respect to a moving direction in which the trace proceeded towards said point of interest and that one pixel of a predetermined type out of said four adjacent pixels which is first found by checking said four adjacent pixels in said direction is designated as a next trace point subsequent to said point of interest;

extracting a feature of each of the pixels at the traced points which form an image of said contour of said pattern; and

identifying said unknown pattern by comparing said features or said unknown pattern with features of a known pattern.

DESIGN PATENTS

GRANTED OCT. 2, 1990

ERRATA

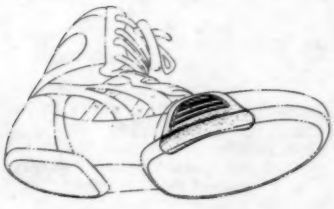
For CLASS	See PATENT NO.
D08-067	310,936

DESIGNS

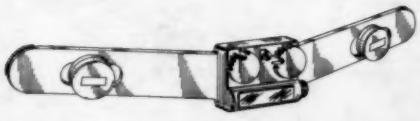
OCTOBER 2, 1990

310,905
X-RAY PROTECTIVE APRON UNIT
Robert Marchione, 38 Kenrick St., Brighton, Mass. 02135
Filed Sep. 1, 1987, Ser. No. 91,705
Term of patent 14 years
U.S. Cl. D2—229

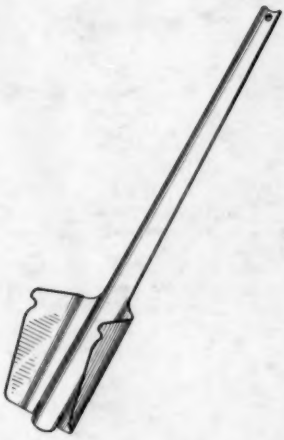
310,906
FRONT SOLE REINFORCEMENT PLATE
Yoshiaki Hase, Akashi, Japan, assignor to Asics Corporation, Hyogo, Japan
Filed Jun. 16, 1987, Ser. No. 62,749
Claims priority, application Japan, Dec. 17, 1986, 61-49920
Term of patent 14 years
U.S. Cl. D2—314



310,907
HEADBAND RADIO
Andrew Mark, 1725 Summer St., Stamford, Conn. 06905
Filed Nov. 7, 1986, Ser. No. 929,653
Term of patent 14 years
U.S. Cl. D2—512

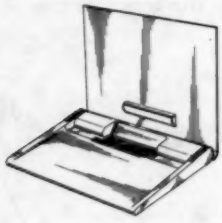


310,908
COMBINED SHOEHORN AND HOSIERY DONNING AID
Anthony Santore, 346 Third Ave., Pelham, N.Y. 10803
Filed Jun. 2, 1987, Ser. No. 57,821
Term of patent 14 years
U.S. Cl. D2—642



310,909
SKI CARRIER
Jo Bradtl, 996 Bayside Cove West, Newport Beach, Calif. 92660
Filed Mar. 11, 1987, Ser. No. 24,550
Term of patent 14 years
U.S. Cl. D3—36

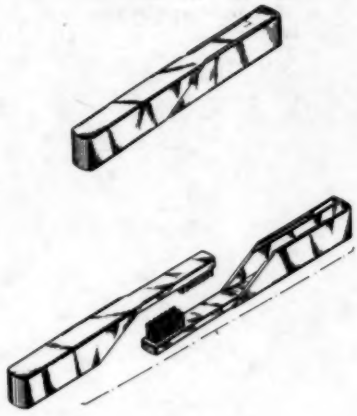
310,910
LIGHTED CREDIT CARD TABLET
Peter Maxymych, St. Laurent; Alan Bourbonniere; Michel Letendre, both of Ville St-Laurent, and Nevenka Prijic, Montreal, all of Canada, assignors to Dompier Equities Ltd., Montreal, Canada
Filed Oct. 3, 1986, Ser. No. 915,005
Term of patent 14 years
U.S. Cl. D3—56



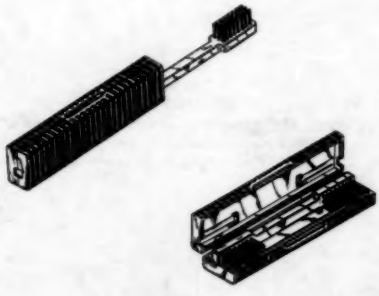
310,911
SUITCASE
Tadao Takeuchi, Tokyo, Japan, assignor to Matsuzaki Industry Co., Ltd., Tokyo, Japan
Filed Jun. 8, 1987, Ser. No. 59,268
Claims priority, application Japan, Dec. 16, 1986, 61-49746
Term of patent 14 years
U.S. Cl. D3—72

310,912
SAW BLADE CADDY
John B. Dennis, Fairway, Kans., assignor to DVI, Prairie Village, Kans.
Filed Feb. 25, 1987, Ser. No. 18,977
Term of patent 14 years
U.S. Cl. D3—73

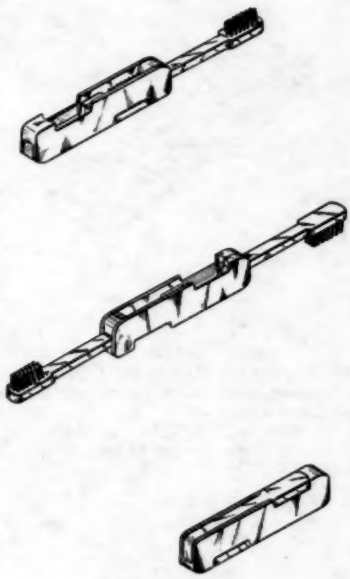
310,913
TOOTHBRUSH AND CONTAINER SET
Emilio Ambasz, 295, Central Park West, New York, N.Y. 10024
Filed May 10, 1988, Ser. No. 192,381
Term of patent 14 years
U.S. Cl. D4—108



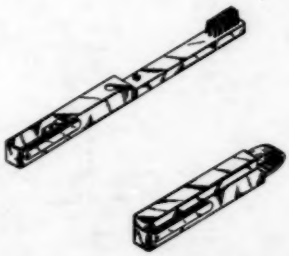
310,914
COMBINED TOOTHBRUSH AND CONTAINER THEREFOR
Emilio Ambasz, 295, Central Park West, New York, N.Y. 10024
Filed May 10, 1988, Ser. No. 192,398
Term of patent 14 years
U.S. Cl. D4—108



310,915
TOOTHBRUSH AND CONTAINER SET
Emilio Ambasz, 295, Central Park West, New York, N.Y. 10024
Filed May 10, 1988, Ser. No. 192,399
Term of patent 14 years
U.S. Cl. D4—108



310,916
COMBINED TOOTHBRUSH AND CONTAINER THEREFOR
Emilio Ambasz, 295, Central Park West, New York, N.Y. 10024
Filed May 10, 1988, Ser. No. 192,400
Term of patent 14 years
U.S. Cl. D4—108

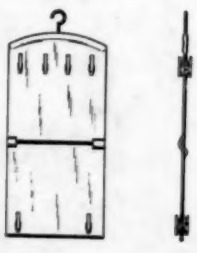


310,917
COMBINED BRUSH AND POWDER DISPENSER
Menachem Futter, Staten Island, N.Y.; James E. Wilson, Bound Brook, N.J., and Annette M. Golden, New York, N.Y., assignors to Revlon, Inc., New York, N.Y.
Filed Oct. 24, 1988, Ser. No. 261,645
Term of patent 14 years
U.S. Cl. D4—114

310,918
COMBINED BRUSH AND POWDER DISPENSER
Menachem Futter, Staten Island, N.Y.; James E. Wilson, Bound Brook, N.J., and Annette M. Golden, New York, N.Y., assignors to Revlon, Inc., New York, N.Y.
Filed Oct. 24, 1988, Ser. No. 261,646
Term of patent 14 years
U.S. Cl. D4—114

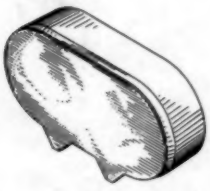
310,919
PHOTOSTAND
Seiji Sakai, No. 405, Kohno Mansions, 3-29-21, Ohmori Kita, Ohta-ku, Tokyo, Japan
Filed Jul. 17, 1987, Ser. No. 75,030
Term of patent 14 years
U.S. Cl. D6—311

310,920
ACCESSORIES HANGER
Susan D. Eichler, 148 Laddie Dr., Washington, Pa. 15301
Filed Oct. 21, 1988, Ser. No. 260,662
Term of patent 14 years
U.S. Cl. D6—326

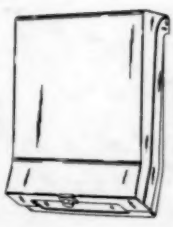


310,921
SWIVEL LOUNGE CHAIR
Kenneth Nagengast, Sommerville, N.J., and Steve Goldmeier, Bayside, N.Y., assignors to Rand International, Farmingdale, N.Y.
Filed Apr. 6, 1984, Ser. No. 597,718
Term of patent 14 years
U.S. Cl. D6—361

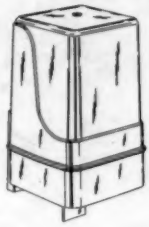
310,922
DOUBLE TOILET PAPER ROLL DISPENSER
Jerry A. Sigmund, Bala Cynwyd, Pa., assignor to Scott Paper Company, Philadelphia, Pa.
Filed Sep. 4, 1987, Ser. No. 93,414
Term of patent 14 years
U.S. Cl. D6—520



310,923
TOWEL DISPENSER
Carl-Arne Breger, Malmö, Sweden, assignor to Holmens Bruk Aktiebolag, Norrköping, Sweden
Filed Sep. 21, 1988, Ser. No. 247,328
Claims priority, application Sweden, Mar. 22, 1988, 88-0737
Term of patent 14 years
U.S. Cl. D6—522

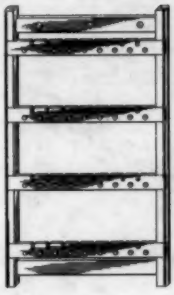


310,924
SOAP DISPENSER
Carl-Arne Breger, Malmö, Sweden, assignor to Holmens Bruk Aktiebolag, Norrköping, Sweden
Filed Sep. 21, 1988, Ser. No. 247,327
Claims priority, application Sweden, Mar. 22, 1988, 88-0736
Term of patent 14 years
U.S. Cl. D6—545



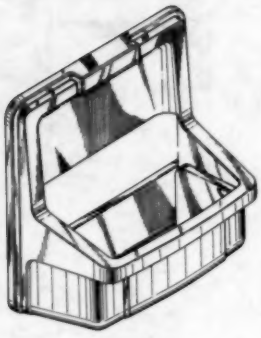
310,925
WALL POCKET FILE
Bob Mervar, Columbus; Kent W. Murphy, Wooster, and Charles W. Craft, Jr., Apple Creek, all of Ohio, assignors to Rubbermaid Incorporated, Wooster, Ohio
Filed Jul. 21, 1988, Ser. No. 222,249
Term of patent 14 years
U.S. Cl. D6—567

310,926
EARRING RACK
Ginny Bass, 2707 SE 35th Pl., Portland, Oreg. 97202, and Dean Caldwell, 4524 SE Neaf Rd., Milwaukie, Oreg. 97267
Filed Jan. 25, 1988, Ser. No. 148,222
Term of patent 14 years
U.S. Cl. D6—570

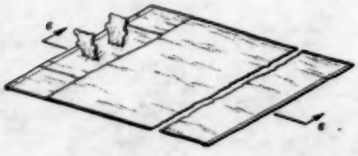


310,927
JEWELRY DISPLAY RACK
Charles L. Scott; Janet S. Scott, and Brenda J. Scott, all of R.D. 2, Arlington, Ky. 42021
Filed Aug. 17, 1988, Ser. No. 233,168
Term of patent 14 years
U.S. Cl. D6—571

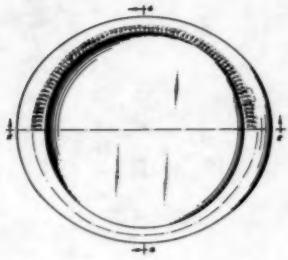
310,928
STORAGE RACK FOR CLEANING SUPPLIES
Kent W. Murphy, Wooster, Ohio, assignor to Rubbermaid Incorporated, Wooster, Ohio
Filed Oct. 27, 1988, Ser. No. 263,331
Term of patent 14 years
U.S. Cl. D6—574



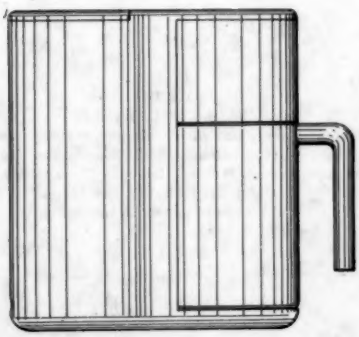
310,929
COMBINED BEDSHEET AND HAND PUPPET POCKETS
Judith Blau, 18 Channing Pl., Eastchester, N.Y. 10709
Filed May 13, 1988, Ser. No. 197,081
Term of patent 14 years
U.S. Cl. D6—602

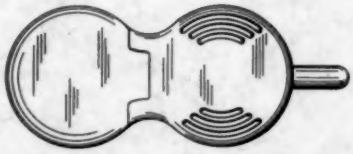


310,930
PLATE OR SIMILAR ARTICLE
Steve A. Unger, Manlius, N.Y., assignor to Syracuse China Corporation, Syracuse, N.Y.
Filed Jul. 27, 1984, Ser. No. 635,164
Term of patent 14 years
U.S. Cl. D7—586



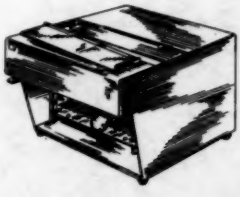
310,931
HOT BEVERAGE MAKER OR THE LIKE
David V. Mollenhoff, 1501 Morrison St., Madison, Wis. 53703
Filed May 12, 1987, Ser. No. 48,792
Term of patent 14 years
U.S. Cl. D7—309



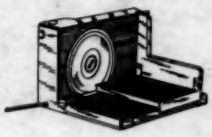


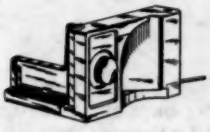
310,932
MACHINE FOR MAKING SOFT ICE DRINK
Yoshihiko Mitsubayashi, Kuwana, Japan, assignor to Chubu Industries, Inc., Kuwana, Japan
Filed Dec. 17, 1987, Ser. No. 134,477
Term of patent 14 years
U.S. Cl. D7—378

310,933
COUNTERTOP BREAD SLICER
Gary L. Kruse, Spring Lake, and Bernard L. Petersen, Grand Rapids, both of Mich., assignors to Oliver Products Company, Grand Rapids, Mich.
Filed Jan. 22, 1988, Ser. No. 146,789
Term of patent 14 years
U.S. Cl. D7—381



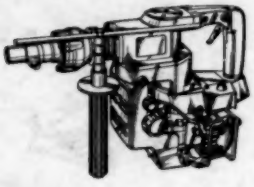
310,934
SLICING MACHINE
Günther Storsberg, Solingen, Fed. Rep. of Germany, assignor to Robert Krups Stiftung & Co. KG., Solingen, Fed. Rep. of Germany
Filed Apr. 20, 1987, Ser. No. 40,325
Claims priority, application Fed. Rep. of Germany, Oct. 22, 1986, 5 MR 9710
Term of patent 14 years
U.S. Cl. D7—383



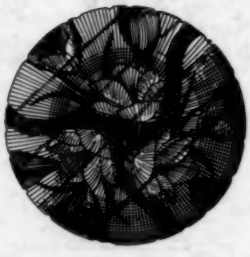


310,935
STANCHION FOR A BEVERAGE TAP
Michael J. Start, Dorset, England, assignor to Homark Associates Limited, Dorset, United Kingdom
Filed Mar. 27, 1987, Ser. No. 31,381
Claims priority, application United Kingdom, Oct. 7, 1986, 1 037 213
Term of patent 14 years
U.S. Cl. D7—397

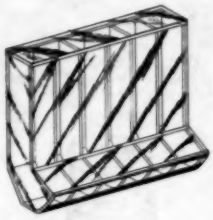
310,936
POWER HAMMER DRILL
Toshiaki Saito, Tokyo, and Shintaro Hara, Hiroshima, both of Japan, assignors to Ryobi Ltd., Hiroshima, Japan
Filed Mar. 8, 1988, Ser. No. 165,677
Claims priority, application Japan, Sep. 9, 1987, 62-36955
Term of patent 14 years
U.S. Cl. D8—67



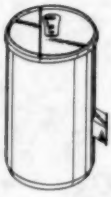
310,937
BOWL OR SIMILAR ARTICLE
Philippe J. Durand, Les Duneaux, Chemin de la Garenne, 62510, Arques, France
Filed Jan. 5, 1988, Ser. No. 140,806
The portion of the term of this patent subsequent to Sep. 25, 2004, has been disclaimed.
Term of patent 14 years
U.S. Cl. D7—564



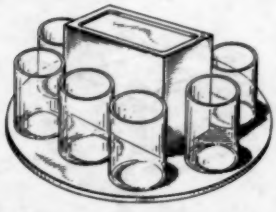
310,938
PILL DISPENSER
Ronald J. Vigil, 2841 Champa St., Denver, Colo. 80205
Filed May 2, 1988, Ser. No. 189,588
Term of patent 14 years
U.S. Cl. D7—589



310,939
SNACK DISPENSER
Frank D. Byrley, 12112 Madeleine Cir., Dallas, Tex. 75230
Filed May 5, 1988, Ser. No. 190,518
Term of patent 14 years
U.S. Cl. D7—589



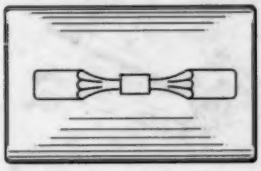
310,940
CONDIMENT TURNTABLE
Allan Kastanek, 5870 Ridge Creek Rd., Shoreview, Minn. 55126
Filed Dec. 12, 1988, Ser. No. 283,516
Term of patent 14 years
U.S. Cl. D7—590



310,941
COMBINED CONTAINER AND COMPARTMENT FOR HOLDING COOLANTS
Walter F. Carty, 654 School St., Lowell, Mass. 01852
Filed Jan. 11, 1988, Ser. No. 142,240
Term of patent 14 years
U.S. Cl. D7—605

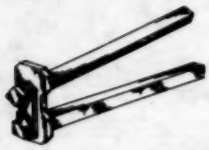
310,942
BABY BOTTLE INSULATOR
Erica Woodall, 19913 Stoneyhaven, Cypress, Tex. 77433
Filed Jul. 29, 1988, Ser. No. 225,954
Term of patent 14 years
U.S. Cl. D7—607

310,943
BOTTLE DRAIN COUPLING
William E. Spencer, Sr., 357 Victor La., Whitesburg, Tenn. 37891
Filed Oct. 25, 1988, Ser. No. 262,017
Term of patent 14 years
U.S. Cl. D7—619

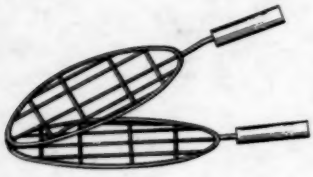


310,944
INFANT'S FEEDING SPOON
Robert S. Lutzker, 21 Lee Ave., East Williston, N.Y. 11596
Filed May 6, 1988, Ser. No. 191,015
Term of patent 14 years
U.S. Cl. D7—655

310,945
NUT SHELLER
John R. Ellerton, Magnetic Island, Australia, assignor to Stahmann Farms Incorporated, Scarborough, Australia
Filed Dec. 19, 1988, Ser. No. 285,961
Claims priority, application Australia, Jun. 21, 1988, 2050/88
Term of patent 14 years
U.S. Cl. D7—680



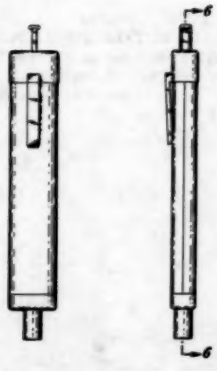
310,946
TORTILLA WARMER
Jeffrey R. White, 2121 Celeste Dr., Modesto, Calif. 95355
Filed Jun. 27, 1988, Ser. No. 211,667
Term of patent 14 years
U.S. Cl. D7—683



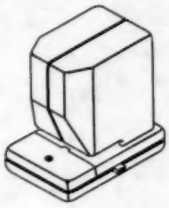
310,947
NUT OPENING TOOL
Robert J. Mason, 19 Wells Pl., Lynn, Mass. 01902
Filed Nov. 23, 1988, Ser. No. 277,063
Term of patent 14 years
U.S. Cl. D7—693

310,948
SINGLE CLAMP TREE BRACE
Donald W. Jensen, Long Beach, Calif., assignor to Sullivan & Mann Lumber Co., Santa Ana, Calif.
Filed Nov. 22, 1988, Ser. No. 274,992
Term of patent 14 years
U.S. Cl. D8—1

310,949
LAMP EXTRACTOR AND INSERTER
Kenneth W. Hotchkiss, Golden, and Arthur B. Woodward, Lakewood, both of Colo., assignors to Proto-Tel, Inc., Boulder, Colo.
Filed Oct. 15, 1987, Ser. No. 109,247
Term of patent 14 years
U.S. Cl. D8—14



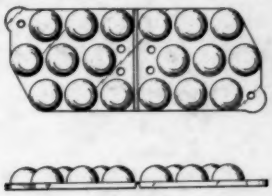
310,950
MOTORIZED STAPLER
Paul Olesen, Bellmore, N.Y., and Patrick F. McDonnell, Monmouth Junction, N.J., assignors to Swingline Inc., Long Island City, N.Y.
Filed Jul. 9, 1987, Ser. No. 73,111
Term of patent 14 years
U.S. Cl. D8—49



310,951
PAIR OF PLIERS
René P. Monnet, Moutiers, France, assignor to Facom, S.A., Morangis, France
Filed Nov. 10, 1987, Ser. No. 118,963
Claims priority, application France, May 11, 1987, 87 2786
Term of patent 14 years
U.S. Cl. D8—52

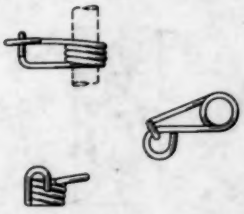
310,952
DOOR CLOSER
Burl M. Finkelstein, Shenandoah, Ga., assignor to Kason Industries, Inc., Shenandoah, Ga.
Filed Mar. 30, 1988, Ser. No. 175,449
Term of patent 14 years
U.S. Cl. D8—330

310,953
PANEL SPACER PAD
Robert J. Ilukowicz, 3 Dock Ct., Port Jefferson, N.Y. 11777, and Rudolf Seifert, Stottmert 2, D5974 Herscheid, Fed. Rep. of Germany
Filed Apr. 22, 1987, Ser. No. 41,321
Term of patent 14 years
U.S. Cl. D8—354

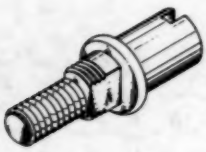


310,954
UNITARY THUMBTACK AND HOOK
Vishnu Persaud, 3006 Laurel Ave., Cheverly, Md. 20785
Filed May 5, 1989, Ser. No. 350,137
Term of patent 14 years
U.S. Cl. D8—367

310,955
ELECTRICAL FENCE CLIP
Conrad M. Platten, Gisbourne, New Zealand, assignor to Wrightson NMA Limited, Gisbourne, New Zealand
Filed Jun. 8, 1987, Ser. No. 59,979
Term of patent 14 years
U.S. Cl. D8—382

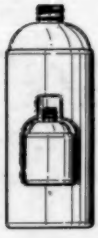


310,956
LOCKING SCREW
Paul Huska, 739 Moreno Ave., Los Ageles, Calif. 90049
Filed Jun. 22, 1987, Ser. No. 64,443
Term of patent 14 years
U.S. Cl. D8—387



310,957
CONTAINER WITH SPRAY DISPENSER TOP
Hans Halm, Herne, and Paul-Otto Weltgen, Hilden, both of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany
Filed Dec. 23, 1987, Ser. No. 137,474
Claims priority, application Fed. Rep. of Germany, Jul. 3, 1987, DM/008895
Term of patent 14 years
U.S. Cl. D9—300

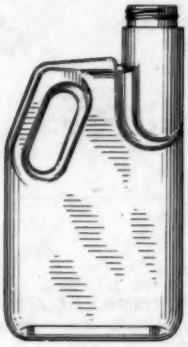
310,958
BOTTLE SET
Frederick N. Biesecker, Boyertown, Pa., assignor to Drug Plastics & Glass Company, Inc., Boyertown, Pa.
Filed Feb. 19, 1988, Ser. No. 157,996
Term of patent 14 years
U.S. Cl. D9—347



310,959
BOTTLE
Caroline Waring, London, England, assignor to Henna (Hair Health) Limited, Eastleigh, England
Filed Apr. 11, 1988, Ser. No. 179,914
Claims priority, application United Kingdom, Oct. 15, 1987, 1045631
Term of patent 14 years
U.S. Cl. D9—367

310,960
BOTTLE WITH CAP
Nicholas B. Verebelyi, London, United Kingdom, assignor to Reckitt & Colman Products Limited, London, United Kingdom
Filed Jun. 3, 1987, Ser. No. 57,834
Claims priority, application United Kingdom, Dec. 4, 1986, 1038566
Term of patent 14 years
U.S. Cl. D9—373

310,961
BOTTLE
Earl Hoyt, Franklin Lakes, N.J., assignor to Reckitt & Colman Inc., Wayne, N.J.
Filed Mar. 9, 1987, Ser. No. 23,295
Term of patent 14 years
U.S. Cl. D9—376

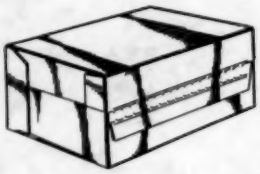


310,962
PERFUME BOTTLE OR SIMILAR ARTICLE
Pierre Dinand, Levallois-Perret, France, assignor to Parfums Loris Azzaro, Paris, France
Filed Apr. 27, 1988, Ser. No. 186,860
Claims priority, application France, Oct. 27, 1987, 87 6294
Term of patent 14 years
U.S. Cl. D9—377

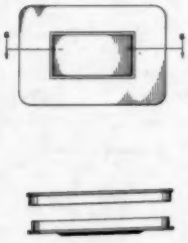
310,963
COMBINED BOTTLE AND CAP
Umberto D. I. Segati, Brussels, Belgium, assignor to Colgate-Palmolive Co., Piscataway, N.J.
Filed Oct. 18, 1988, Ser. No. 259,544
Term of patent 14 years
U.S. Cl. D9—404

310,964
BOTTLE
Richard L. Weckman, Perrysburg, Ohio, assignor to Owens-Brockway Glass Container Inc., Toledo, Ohio
Filed Feb. 27, 1987, Ser. No. 19,920
Term of patent 14 years
U.S. Cl. D9—408

310,965
ICE CREAM CARTON
Frank G. Capuano, Rochester, N.Y., assignor to Somerville Packaging Corporation, Newport News, Va.
Filed Dec. 14, 1987, Ser. No. 132,856
The portion of the term of this patent subsequent to Dec. 15, 2001, has been disclaimed.
Term of patent 14 years
U.S. Cl. D9—416



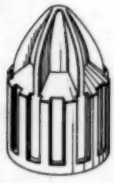
310,966
EMERGENCY MEDICAL INFORMATION CONTAINER
Samuel F. Speers, Sarasota, Fla., assignor to Design Data, Inc., East Greenwich, R.I.
Filed May 18, 1987, Ser. No. 51,674
Term of patent 14 years
U.S. Cl. D9—418



310,967
CONTAINER FOR DOLLS
Dirk Röethling, Rödental, Fed. Rep. of Germany, assignor to Firma Max Zapf, Rodental, Fed. Rep. of Germany
Filed Feb. 12, 1988, Ser. No. 155,837
Claims priority, application Fed. Rep. of Germany, Nov. 9, 1987, MR 4692
Term of patent 14 years
U.S. Cl. D9—418

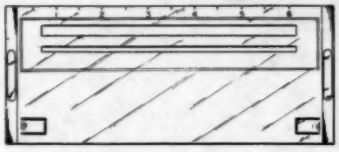
310,968
CONTAINER
Erik Nordskog, Woodland Hills, Calif., assignor to TLB, Inc., Calabasas, Calif.
Filed May 13, 1988, Ser. No. 193,994
Term of patent 14 years
U.S. Cl. D9—420

310,969
CONTAINER CLOSURE
Anthony R. Butler, Cromwell, Conn., assignor to Loctite Corporation, Newington, Conn.
Filed Jan. 6, 1988, Ser. No. 141,350
Term of patent 14 years
U.S. Cl. D9—453

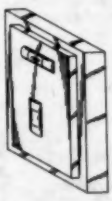


310,970
COMBINED COMPASS AND THERMOMETER
Marlin D. Iden, Riverton, Wyo., assignor to The Brunton Company, Riverton, Wyo.
Filed Feb. 13, 1987, Ser. No. 14,646
Term of patent 14 years
U.S. Cl. D10—53

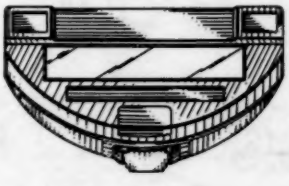
310,971
COMBINED TEMPLATE-BOOKMARK, AND RULER
Harvey Friedman, 211 Thompson St., New York, N.Y. 10012
Filed Apr. 3, 1987, Ser. No. 35,164
Term of patent 14 years
U.S. Cl. D10—62



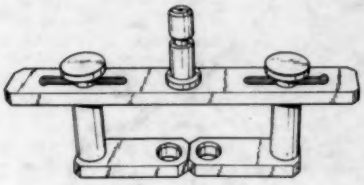
310,972
CARPENTER'S GAUGE FOR INSTALLING TRIM AROUND DOORS AND WINDOWS
Perry Neuman, 233 Duncan Ave., Cheboygan, Mich. 49721
Filed Mar. 30, 1987, Ser. No. 31,685
Term of patent 14 years
U.S. Cl. D10—65



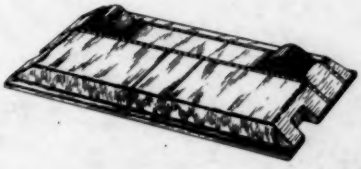
310,973
DEVICE FOR USE WITH UTILITY METERS TO RECORD TIME OF ENERGY USE, DEMAND AND LOAD PROFILE DATA
Cree A. Edwards, Belmont, and Larsh M. Johnson, San Francisco, both of Calif., assignors to Domestic Automation Company Inc., San Carlos, Calif.
Filed Aug. 29, 1986, Ser. No. 903,068
Term of patent 14 years
U.S. Cl. D10—75



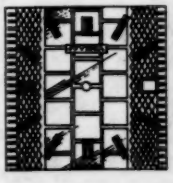
310,974
WHEEL CAMBER METER MOUNTING
Andrew E. Wilkinson, Torshälla, and Karl E. P. Andersson, Falköping, both of Sweden, assignors to Nicator AB, Eskilstuna, Sweden
Filed Nov. 3, 1987, Ser. No. 116,333
Term of patent 14 years
U.S. Cl. D10—82



310,975
ULTRASONIC TRANSMITTING AND RECEIVING CASE FOR ALARM SYSTEMS
Giovanni Arduini; Lorenzo Bonfanti, and Gianfranco Salvemini, all of Milan, Italy, assignors to Delta Elettronica s.p.a., Varese, Italy
Filed Sep. 30, 1987, Ser. No. 103,252
Claims priority, application Italy, May 18, 1987, 60919/87[U]
Term of patent 14 years
U.S. Cl. D10—106



310,976
WATCH DIAL
Michel Theurillat, La Chaux-De-Fonds, Switzerland, assignor to Juvenia Horlogerie de Précision S.A., La Chaux-de-Fonds, Switzerland
Filed Oct. 23, 1987, Ser. No. 113,801
Claims priority, application Int'l Pat. Institute, Apr. 23, 1987, DM/008534
Term of patent 14 years
U.S. Cl. D10—125

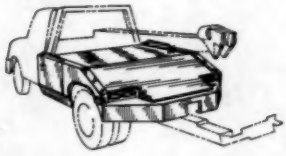


310,977
CLOCK FACE
David A. Jones, 2 Thornton Street, Christchurch, New Zealand
Filed Feb. 18, 1987, Ser. No. 16,200
Term of patent 14 years
U.S. Cl. D10—126

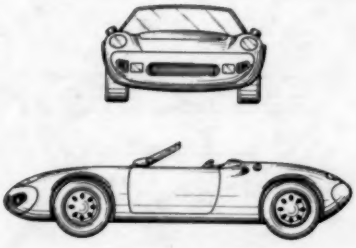
310,978
CHAIN-LIKE NECKLACE
Paolo Bulgari, Roma, Italy, assignor to Partecipazioni Bulgari S.p.A., Rome, Italy
Filed Dec. 14, 1987, Ser. No. 132,118
Claims priority, application Italy, Jun. 22, 1987, 35871/87[U]
Term of patent 14 years
U.S. Cl. D11—3

310,979
EARRING
Constance A. Perry, 9 Chester Pl., Somerville, Mass. 02144
Filed Dec. 18, 1987, Ser. No. 135,625
Term of patent 14 years
U.S. Cl. D11—43

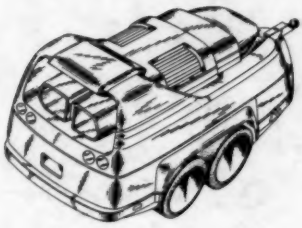
310,980
TOWING VEHICLE BODY
Leslie Bubik, Toronto, Canada, assignor to Vulcan Equipment Company, Ontario, Canada
Filed Feb. 12, 1988, Ser. No. 155,621
Term of patent 14 years
U.S. Cl. D12—14



310,981
SPORTS CAR
James A. Kutza, 2138 W. McLean Ave., Chicago, Ill. 60647
Filed Aug. 29, 1988, Ser. No. 237,563
Term of patent 14 years
U.S. Cl. D12—92

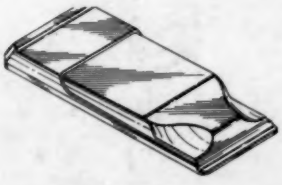


310,982
TRAILER
William J. Badsey, San Juan, Calif., assignor to Autowash Holdings, Inc., San Juan Capistrano, Calif.
Filed Jun. 6, 1988, Ser. No. 202,997
Term of patent 14 years
U.S. Cl. D12—102

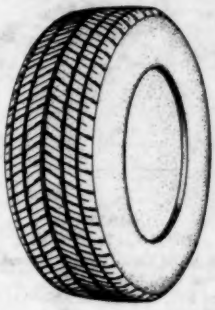


310,983
TRICYCLE
Steven Goldmeier, Old Bethpage, N.Y., assignor to Rand International, Farmingdale, N.Y.
Filed Jan. 26, 1988, Ser. No. 149,065
Term of patent 14 years
U.S. Cl. D12—112

310,984
VAN ROOF FOR CUSTOMIZED CONVERSION VANS
Boyd R. Mayhew, 122 Foursome La., Carl Junction, Mo. 64834
Filed Jul. 12, 1988, Ser. No. 218,050
Term of patent 14 years
U.S. Cl. D12—156



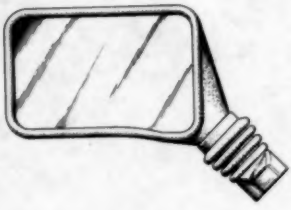
310,985
TIRE
Darrell E. Covert, Uniontown; Philip S. Hammond, Mogadore, and Paul B. Maxwell, Akron, all of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio
Filed Jul. 11, 1988, Ser. No. 217,741
Term of patent 14 years
U.S. Cl. D12—147



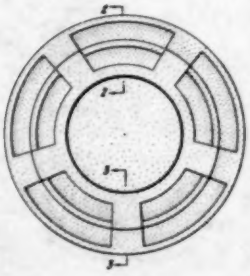
310,986
TIRE
Darrell E. Covert, Uniontown, and Paul B. Maxwell, Akron, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio
Filed Oct. 17, 1988, Ser. No. 259,010
Term of patent 14 years
U.S. Cl. D12—147

310,987
COVER FOR THE BED OF A PICKUP TRUCK
Don C. Law, Arlington, Tex., and Richard Gibbs, Auburndale, Fla., assignors to Brahma, Inc., Grand Prairie, Tex.
Filed Jul. 6, 1988, Ser. No. 216,735
Term of patent 14 years
U.S. Cl. D12—156

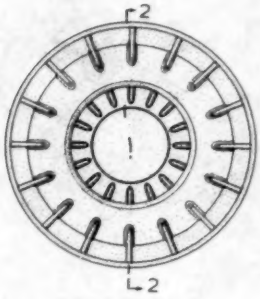
310,988
REAR VIEW MIRROR
Pierre Charet, and Duke Kraai, both of Miami, Fla., assignor to Rally Accessories, Inc., Miami, Fla.
Filed Feb. 3, 1988, Ser. No. 151,794
Term of patent 14 years
U.S. Cl. D12—187



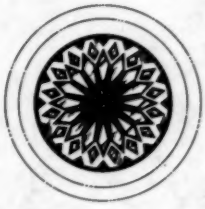
310,989
WHEEL COVER
David R. North, Warren, and Charles H. Stewart, Royal Oak, both of Mich., assignors to General Motors Corporation, Detroit, Mich.
Filed Aug. 1, 1988, Ser. No. 225,659
Term of patent 14 years
U.S. Cl. D12—206



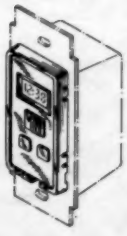
310,990
VEHICLE WHEEL SEGMENT
Maurice P. Chandler, Utica, Mich., assignor to General Motors Corporation, Detroit, Mich.
Filed Jun. 27, 1988, Ser. No. 212,369
Term of patent 14 years
U.S. Cl. D12—212



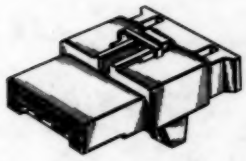
310,991
AUTOMOBILE WHEEL CENTER CAP
Gary Ackerly, 700 Chettic Ave., Copiague, N.Y. 11726
Filed Mar. 7, 1988, Ser. No. 164,725
Term of patent 14 years
U.S. Cl. D12—213



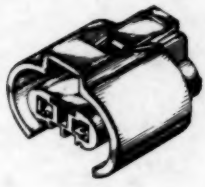
310,992
COMBINED COVER PLATE AND SWITCHES FOR ELECTRONIC WIRING DEVICE
Saul Rosenbaum, East Meadow, N.Y., and Ronald Landisi, Fairfield, Conn., assignors to Leviton Manufacturing Co., Inc., Little Neck, N.Y.
Filed Aug. 11, 1988, Ser. No. 230,929
Term of patent 14 years
U.S. Cl. D13—170



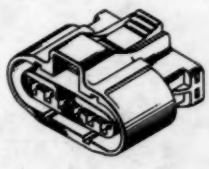
310,993
ELECTRICAL CONNECTOR ASSEMBLY
Kenzi Ohkura, Hisai, and Sho-Ichi Sugata, Suzuka, both of Japan, assignors to Sumitomo Wiring Systems, Ltd., Suzuka, Japan
Filed Jan. 11, 1988, Ser. No. 143,104
Claims priority, application Japan, Jul. 10, 1987, 62-28166; Jul. 10, 1987, 62-28167
Term of patent 14 years
U.S. Cl. D13—146



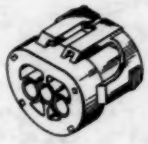
310,994
HOUSING FOR AN ELECTRICAL CONNECTOR
Sakai Yagi, and Norimichi Yashima, both of Shizuoka, Japan, assignors to Yazaki Corporation, Japan
Filed Mar. 18, 1988, Ser. No. 169,726
Claims priority, application Japan, Sep. 18, 1987, 62-37858; Sep. 18, 1987, 62-37859
Term of patent 14 years
U.S. Cl. D13—146



310,995
HOUSING FOR AN ELECTRICAL CONNECTOR
Takayuki Yamamoto, Shizuoka, Japan, assignor to Yazaki Corporation, Japan
Filed Apr. 28, 1988, Ser. No. 187,580
Claims priority, application Japan, Oct. 30, 1987, 62-44170
Term of patent 14 years
U.S. Cl. D13—146

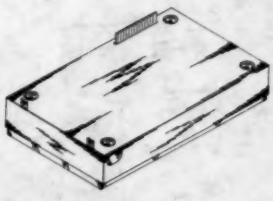


310,996
HOUSING FOR AN ELECTRICAL CONNECTOR
Shigemitsu Inaba; Kiyohito Fukuda, and Masakuni Samejima, all of Shizuoka, Japan, assignors to Yazaki Corporation, Japan
Filed May 10, 1988, Ser. No. 192,425
Claims priority, application Japan, Nov. 10, 1987, 62-45643
Term of patent 14 years
U.S. Cl. D13—146

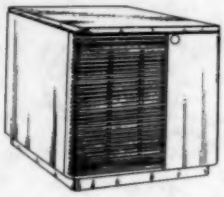


310,997
HOLDER FOR CELLULAR TELEPHONE
Ronald W. Tholberg, 17404 Burma St., Encino, Calif. 91316
Filed Jun. 12, 1987, Ser. No. 60,849
Term of patent 14 years
U.S. Cl. D14—65

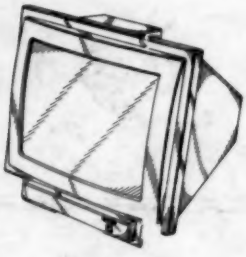
310,998
EXPANSION UNIT FOR A PERSONAL COMPUTER
Troy A. Lee, Nicholasville; Peter J. Mendel, Lexington, both of Ky., and Ronald A. Smith, Apex, N.C., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Apr. 14, 1987, Ser. No. 38,267
Term of patent 14 years
U.S. Cl. D14—100



310,999
ELECTRONIC ENCLOSURE OR SIMILAR ARTICLE
Michael J. Nuttall, Palo Alto, and Lawrence Lam, Walnut Creek, both of Calif., assignors to Bell & Howell Publication Systems Company, Skokie, Ill.
Filed Jun. 7, 1988, Ser. No. 203,752
Term of patent 14 years
U.S. Cl. D14—102

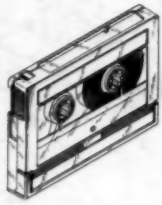


311,000
DISPLAY
Mario Bellini, Milan, Italy, assignor to Ing. C. Olivetti & C., S.p.A., Ivrea, Italy
Filed Sep. 12, 1988, Ser. No. 243,015
Claims priority, application Italy, Mar. 15, 1988, 52973/88[U]
Term of patent 14 years
U.S. Cl. D14—113



311,001
VERTICAL STAND FOR CENTRAL PROCESSING UNIT
H. Charles Hassel, Los Angeles, and Alan W. B. Nash, Van Nuys, both of Calif., assignors to MicroComputer Accessories Inc., Los Angeles, Calif.
Filed Sep. 8, 1987, Ser. No. 93,909
Term of patent 14 years
U.S. Cl. D14—114

311,002
MAGNETIC TAPE CASSETTE
Takateru Satoh, Saku; Masaru Ikebe, Komoro, and Kimio Tanaka, Saku, all of Japan, assignors to TDK Corporation, Tokyo, Japan
Filed Aug. 26, 1987, Ser. No. 89,615
Term of patent 14 years
U.S. Cl. D14—121



311,003
TELEVISION RECEIVER
Yasuaki Isonaga, Kawasaki, Japan, assignor to Sony Corporation, Tokyo, Japan
Filed Dec. 5, 1988, Ser. No. 280,133
Claims priority, application Japan, Jun. 3, 1988, 63-22048
Term of patent 14 years
U.S. Cl. D14—126

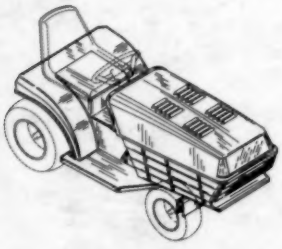
311,004
COMBINED VIDEO TAPE RECORDER AND TELEVISION RECEIVER
Takeshi Iwama, Tokorozawa, Japan, assignor to Sony Corporation, Tokyo, Japan
Filed Sep. 16, 1988, Ser. No. 245,383
Claims priority, application Japan, Jun. 14, 1988, 63-23504
Term of patent 14 years
U.S. Cl. D14—129

311,005
COMBINED TAPE RECORDER AND RADIO RECEIVER
Yasuaki Isonaga, Kawasaki, Japan, assignor to Sony Corporation, Tokyo, Japan
Filed May 12, 1988, Ser. No. 193,358
Claims priority, application Japan, Nov. 12, 1987, 62-46357
Term of patent 14 years
U.S. Cl. D14—163

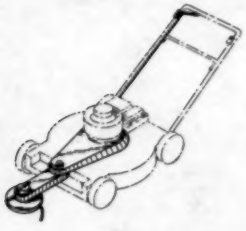
311,006
CASSETTE TAPE RECORDER
Ichiro Hino, Rivervale, N.J., and Masayoshi Tsuchiya, Tokyo, Japan, assignors to Sony Corporation, Tokyo, Japan
Filed Oct. 28, 1987, Ser. No. 113,718
Claims priority, application Japan, Apr. 30, 1987, 62-17044
Term of patent 14 years
U.S. Cl. D14—165

311,007
EARPHONE
Takefumi Daido, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan
Filed Dec. 17, 1987, Ser. No. 133,991
Claims priority, application Japan, Jun. 17, 1987, 62-24705
Term of patent 14 years
U.S. Cl. D14—205

311,008
LAWN MOWER BODY
John R. Durfee, Ankeny, and Harlan J. Trefz, Polk City, both of Iowa, assignors to Noma Outdoor Products, Inc., Jackson, Tenn.
Filed May 31, 1988, Ser. No. 200,194
Term of patent 14 years
U.S. Cl. D15—15



311,009
GRASS TRIMMER ATTACHMENT FOR LAWN MOWERS
Robert W. Wilkins, 159 Whispering Creek Dr., King, N.C. 27021
Filed Dec. 2, 1988, Ser. No. 279,148
Term of patent 14 years
U.S. Cl. D15—17

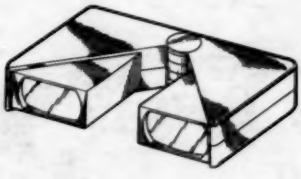


311,010
CUTTING TOOL INSERT
Kenneth L. Niebauer, Raleigh, N.C., assignor to Kennametal Inc., Latrobe, Pa.
Filed Jan. 22, 1988, Ser. No. 147,379
The portion of the term of this patent subsequent to Dec. 5, 2003, has been disclaimed.
Term of patent 14 years
U.S. Cl. D15—139

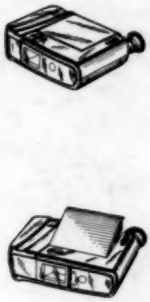
311,011
EYEGLASSES
Ferdinand A. Porsche, Gries, Austria, assignor to Optyl Eyewear Fashion International Corporation, Norwood, N.J.
Filed Jan. 22, 1987, Ser. No. 6,632
Claims priority, application Fed. Rep. of Germany, Aug. 5, 1986, 16770
Term of patent 14 years
U.S. Cl. D16—102

311,012
SPECTACLES WITH APERTURED FRAME OR SIMILAR ARTICLE
Kenneth Grange, London, England, assignor to Polaroid Corporation, Cambridge, Mass.
Filed Apr. 12, 1988, Ser. No. 180,395
Term of patent 14 years
U.S. Cl. D16—102

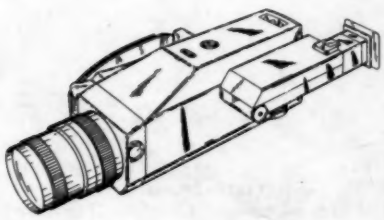
311,013
BINOCULARS
Shouji Wakayama, and Akio Akiyama, both of c/o Young Optical Co., Ltd., No. 2-16-12, Tateishi, Katsushika-ku, Tokyo, Japan
Filed Sep. 15, 1988, Ser. No. 244,461
Term of patent 14 years
U.S. Cl. D16—133



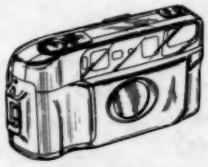
311,014
STILL VIDEO CAMERA
Keisuke Tejima, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan
Filed Jan. 26, 1988, Ser. No. 149,066
Claims priority, application Japan, Nov. 30, 1987, 62-48965
Term of patent 14 years
U.S. Cl. D16—202



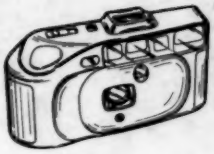
311,015
VIDEO CAMERA OR SIMILAR ARTICLE
Enrique Alie, Brooklyn, and Joseph Galli, Jr., New York, both of N.Y., assignors to Polaroid Corporation, Cambridge, Mass.
Filed May 10, 1988, Ser. No. 192,498
Term of patent 14 years
U.S. Cl. D16—202



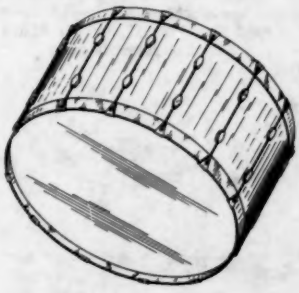
311,016
CAMERA
Noboru Tanaka, Kawasaki, and Takayuki Tsuboi, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Dec. 1, 1987, Ser. No. 128,893
Claims priority, application Japan, Jun. 1, 1987, 62-22740
Term of patent 14 years
U.S. Cl. D16—209



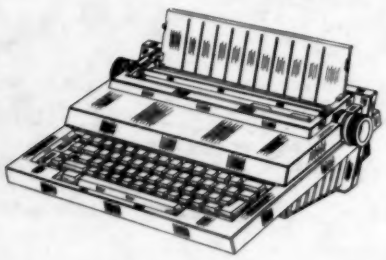
311,017
CAMERA
Michio Yoshida, Tokyo, Japan, and Takanori Kodaira, Taichung, Taiwan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Dec. 8, 1987, Ser. No. 130,661
Claims priority, application Japan, Jun. 10, 1987, 62-23862
Term of patent 14 years
U.S. Cl. D16—209



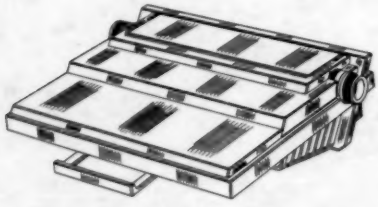
311,018
BASS DRUM AND SUPPORT THEREFOR
James T. Corder, 2403 Gladstone Dr., Huntsville, Ala. 35811
Filed Aug. 6, 1987, Ser. No. 82,101
Term of patent 14 years
U.S. Cl. D17—22



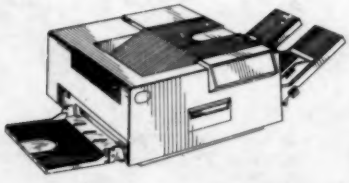
311,019
PORTABLE ELECTRONIC TYPEWRITER
Mario Bellini, Milan, Italy, assignor to Ing. C. Olivetti & C., S.p.A., Ivrea, Italy
Filed Jul. 8, 1987, Ser. No. 71,050
Claims priority, application Italy, Feb. 18, 1987, 53033-B/87
Term of patent 14 years
U.S. Cl. D18—1



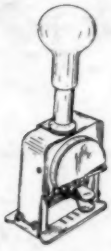
311,020
TYPEWRITER HOUSING WITH COVER
Mario Bellini, Milan, Italy, assignor to Ing. C. Olivetti & C., S.p.A., Ivrea, Italy
Filed Jul. 8, 1987, Ser. No. 71,052
Claims priority, application Italy, Feb. 18, 1987, 53033-B/87
Term of patent 14 years
U.S. Cl. D18—1



311,021
PRINTER
Douglas E. Goodner, Charlotte, N.C.; Jeffrey L. Kline, Austin, Tex., and Anthony M. Roberti, Charlotte, N.C., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Mar. 31, 1987, Ser. No. 32,883
Term of patent 14 years
U.S. Cl. D18—13

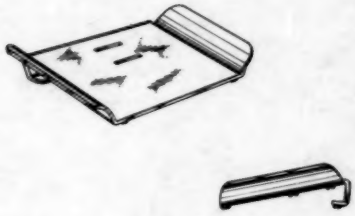


311,022
NUMBERING MACHINE
John Leszczak, Roselle Park, N.J., assignor to The Bates Manufacturing Company, Hackettstown, N.J.
Filed Feb. 27, 1987, Ser. No. 20,322
Term of patent 14 years
U.S. Cl. D18—15



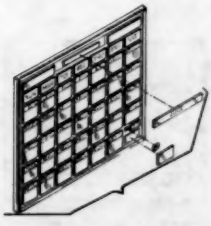
311,023
ANIMATED ALPHABET FONT
Kathy M. Klein, and Shanna L. Klein, both of Rte. 1, Cherry Dr., Prescott, Wis. 54021
Filed Feb. 16, 1989, Ser. No. 311,587
Term of patent 14 years
U.S. Cl. D18—27

311,024
CALENDAR TRAY
Robert E. Hawes, Jr., Huntington Bay, and Eric Auldenberg, Bayside, both of N.Y., assignors to Esselte Pendaflex Corporation, Garden City, N.Y.
Filed Mar. 22, 1988, Ser. No. 171,914
Term of patent 14 years
U.S. Cl. D19—20



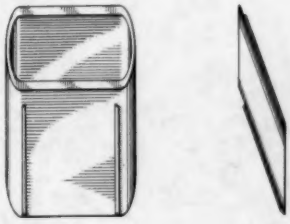
311,025
COMBINED CARD CALENDER AND CONTAINER THEREFOR
Kiri Bermack, 70 Knolls Dr. N., Manhasset Hills, N.Y. 11040
Filed Jun. 25, 1987, Ser. No. 66,943
Term of patent 14 years
U.S. Cl. D19—21

311,026
COMBINED CALENDAR AND MESSAGE BOARD
Steven DePoyster, 13675 Wide Acres Rd., Golden, Colo. 80401
Filed Jun. 28, 1988, Ser. No. 212,726
Term of patent 14 years
U.S. Cl. D19—25

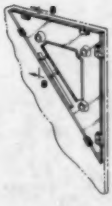


311,027
COMBINED PENCIL SHARPENER AND HOLDER FOR WRITING INSTRUMENTS
John S. Yuen, Kowloon, Hong Kong, assignor to John Manufacturing Limited, Kowloon, Hong Kong
Filed Apr. 22, 1987, Ser. No. 41,318
Claims priority, application United Kingdom, Nov. 12, 1986, 1 038 013
Term of patent 14 years
U.S. Cl. D19—73

311,028
FILE ASSEMBLY
Mel Evenson, San Pedro, Calif., assignor to Eldon Industries, Inc., Inglewood, Calif.
Filed Jan. 16, 1987, Ser. No. 4,021
The portion of the term of this patent subsequent to May 10, 2002, has been disclaimed.
Term of patent 14 years
U.S. Cl. D19—90



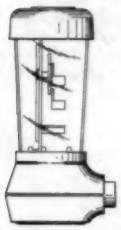
311,029
HOLDER FOR ADVERTISING DISPLAY OR THE LIKE
Robert B. Nielsen, 720 Fife Ct., Barrington, Ill. 60010
Filed May 11, 1988, Ser. No. 192,848
Term of patent 14 years
U.S. Cl. D20—10



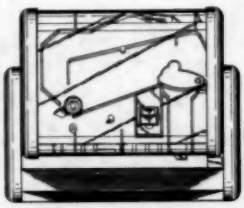
311,030
VIDEO TAPE LABEL
Sean M. K. Lanigan, 305 E. Newhall, Waukesha, Wis. 53186
Filed Oct. 11, 1988, Ser. No. 256,376
Term of patent 14 years
U.S. Cl. D20—22

311,031
BASEBALL PITCHING PRACTICE DEVICE
Léandre Poitras, 465 Seigneuriale Street, Beauport, Quebec, Canada (G1C 3R3)
Filed Oct. 2, 1987, Ser. No. 103,801
Term of patent 14 years
U.S. Cl. D21—5

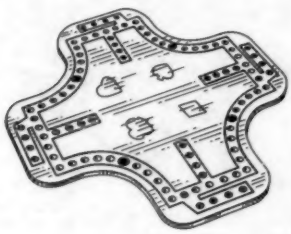
311,032
WATER GAME
Makiko Watanabe, Tokyo, Japan, assignor to Tomy Kogyo Co., Inc., Tokyo, Japan
Filed Jan. 11, 1988, Ser. No. 141,904
Claims priority, application Japan, Jul. 20, 1987, 62-29378
Term of patent 14 years
U.S. Cl. D21—12



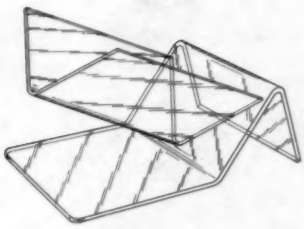
311,033
ROTATABLE GAME HOUSING
Kaori Yokoyama, Tokyo, Japan, assignor to Tomy Kogyo Co., Inc., Tokyo, Japan
Filed Apr. 1, 1988, Ser. No. 176,416
Claims priority, application Japan, Oct. 8, 1987, 62-41219
Term of patent 14 years
U.S. Cl. D21—12



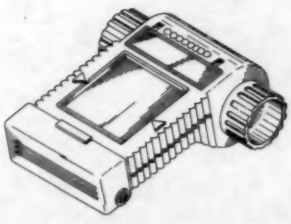
311,034
GAME BOARD
Tim LaRiviere, 558 Burlington Avenue, Burlington, Ontario, Canada (L7S 1S1)
Filed Aug. 27, 1987, Ser. No. 89,796
Term of patent 14 years
U.S. Cl. D21—20



311,035
HOLDER FOR GAME CHIPS
Chester H. Ahola, 16141 Puritus Ave., Cleveland, Ohio 44135
Filed Apr. 24, 1987, Ser. No. 41,919
Term of patent 14 years
U.S. Cl. D21—54

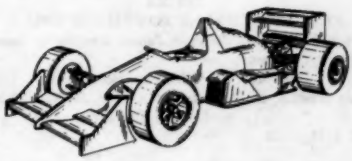


311,036
EDUCATIONAL TOY VIEWING MACHINE
Michael B. Kelly, East Aurora, N.Y., assignor to The Quaker Oats Company, Chicago, Ill.
Filed Oct. 11, 1988, Ser. No. 256,288
Term of patent 14 years
U.S. Cl. D21—59



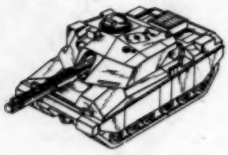
311,037
BOOMERANG
Larry R. Parks, 19323 Dalby, Redford, Mich. 48240
Filed May 11, 1987, Ser. No. 48,135
Term of patent 14 years
U.S. Cl. D21—82

311,038
MODEL RACING CAR
Patrick M. C. Head, Aston Tirrold, Great Britain, assignor to Williams Grand Prix Engineering Ltd., Oxfordshire, England
Filed Aug. 25, 1988, Ser. No. 236,629
Claims priority, application United Kingdom, Feb. 26, 1988, 1038805
Term of patent 14 years
U.S. Cl. D21—137



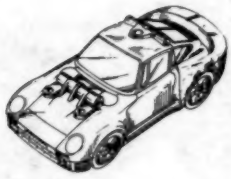
311,039
PNEUMATIC TOY FIGURE
Jose Ortiz, 268 Goodwin St., Perth Amboy, N.J. 08861
Filed Jun. 22, 1987, Ser. No. 64,948
Term of patent 14 years
U.S. Cl. D21—150

311,040
RECONFIGURABLE TOY TANK
Takashi Kunihiro, Abiko, Japan, assignor to Takara Co., Ltd., Tokyo, Japan
Filed Mar. 8, 1988, Ser. No. 165,563
Claims priority, application Japan, Nov. 6, 1987, 62-45315
Term of patent 14 years
U.S. Cl. D21—150

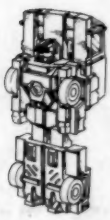


311,041
RECONFIGURABLE TOY MIXER TRUCK
Muneyoshi Shinohara, Matsudo, Japan, assignor to Takara Co., Ltd., Tokyo, Japan
Filed Apr. 21, 1988, Ser. No. 184,164
Claims priority, application Japan, Nov. 26, 1987, 62-48054
Term of patent 14 years
U.S. Cl. D21—150

311,042
RECONFIGURABLE TOY VEHICLE
Tetsuya Ikeda, Chiba, Japan, assignor to Takara Co., Ltd., Tokyo, Japan
Filed Apr. 25, 1988, Ser. No. 186,127
Claims priority, application Japan, Nov. 9, 1987, 62-45777
Term of patent 14 years
U.S. Cl. D21—150



311,043
RECONFIGURABLE TOY VEHICLE
Takashi Kunihiro, Abiko, Japan, assignor to Takara Co., Ltd., Tokyo, Japan
Filed Jun. 24, 1988, Ser. No. 211,408
Claims priority, application Japan, Jan. 25, 1988, 63-2576
Term of patent 14 years
U.S. Cl. D21—150



311,044
MOTOR DRIVEN TOY CACTUS
Yasuta Satoh, Nagareyama, and Shinya Saitoh, Tokyo, both of Japan, assignors to Takara Co., Ltd., Tokyo, Japan
Filed Sep. 12, 1989, Ser. No. 406,129
Claims priority, application Japan, Jun. 12, 1989, 1-21655
Term of patent 14 years
U.S. Cl. D21—150

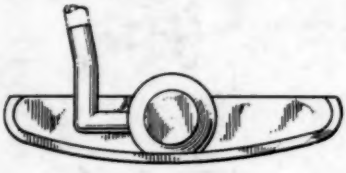
311,045
NOVELTY SANTA CLAUS BALL GOLF BALL FIGURE
George M. Colclasure, Oklahoma City, Okla., assignor to Laid Back Enterprises, Inc., Oklahoma City, Okla.
Filed Aug. 3, 1987, Ser. No. 80,691
Term of patent 14 years
U.S. Cl. D21—155

311,046
TOY ANIMAL FIGURE
Theresa M. Yaneck, 1328 W. Thorndale Ave., Chicago, Ill. 60660
Filed Jan. 11, 1988, Ser. No. 142,232
Term of patent 14 years
U.S. Cl. D21—159

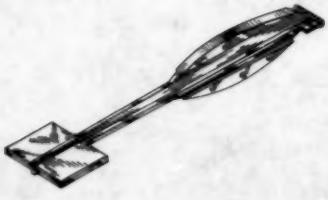
311,047
EXERCISE BICYCLE
Teodoro Carnielli, Via Dante, 61-31029 Vittorio Veneto (Treviso), Italy
Filed Dec. 8, 1988, Ser. No. 281,484
Claims priority, application Italy, Sep. 15, 1988, 21877/88[U]
Term of patent 14 years
U.S. Cl. D21—194

311,048
VOLLEYBALL STAND SUPPORT
Raymond P. Myrtle, 10 - 1214 West 7th Avenue, Vancouver, British Columbia, Canada (V6H 1B6)
Filed Jun. 26, 1987, Ser. No. 66,639
Term of patent 14 years
U.S. Cl. D21—199

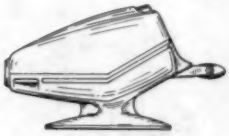
311,049
GOLF CLUB HEAD
Robert P. Sanchez, 934 West Willow, Chicago, Ill. 60614
Filed May 27, 1987, Ser. No. 54,817
Term of patent 14 years
U.S. Cl. D21—219



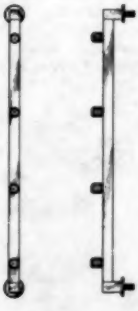
311,050
FLY SWATTER
Mark R. Lisitza, 2013 S. 83rd St., West Allis, Wis. 53219
Filed Jun. 29, 1987, Ser. No. 68,048
Term of patent 14 years
U.S. Cl. D22—124



311,051
FISHING REEL
Robert J. Peterson, Claremore, Okla., assignor to Swede Industries, Inc., Claremore, Okla.
Filed Jul. 6, 1988, Ser. No. 215,923
Term of patent 14 years
U.S. Cl. D22—141

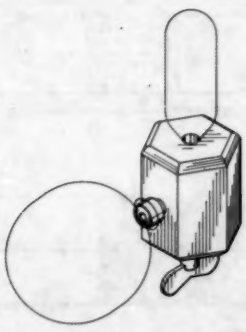


311,053
ELONGATED SHOWER HEAD WITH PLURAL SPRAY NOZZLES
Jean-Claude Delepine, 23, rue Clapeyron, 75008 Paris, France
Filed Jul. 12, 1988, Ser. No. 217,813
Claims priority, application Int'l Pat. Institute, Jan. 13, 1988, DM/010048
Term of patent 14 years
U.S. Cl. D23—213

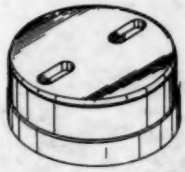


311,054
ELONGATED SHOWER HEAD WITH PLURAL SPRAY NOZZLES
Jean-Claude Delepine, 23, rue Clapeyron, 75008 Paris, France
Filed Jul. 12, 1988, Ser. No. 217,890
Claims priority, application Int'l Pat. Institute, Jan. 13, 1988, DM/010048
Term of patent 14 years
U.S. Cl. D23—213

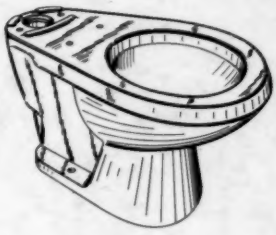
311,055
VALVE FOR INFLATING TIRES, BALLOONS, OR THE LIKE
John D. Corley, 410 Hernandos Loop, Leander, Tex. 78641
Filed May 18, 1988, Ser. No. 195,179
Term of patent 14 years
U.S. Cl. D23—233



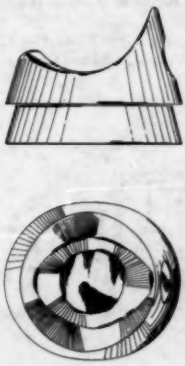
311,056
END CAP FOR A TUBE
Don Patterson, 4298 Shirley La., Salt Lake City, Utah 84124
Filed Sep. 5, 1986, Ser. No. 904,263
Term of patent 14 years
U.S. Cl. D23—260



311,057
TOILET OR THE LIKE
Henry M. Stairs, Jr., Neshanic, N.J., assignor to American Standard Inc., New York, N.Y.
Filed Dec. 1, 1987, Ser. No. 128,536
Term of patent 14 years
U.S. Cl. D23—295

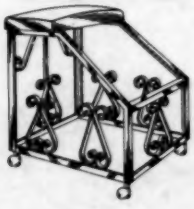


311,058
TOILET TRAINING CHAIR FOR CHILDREN
Eveline Brunel, 57, rue de Lyon, 75012 Paris, France
Filed May 18, 1987, Ser. No. 50,380
Term of patent 14 years
U.S. Cl. D23—296



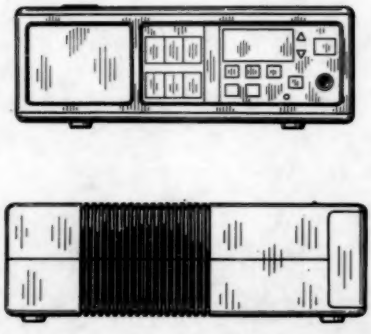
311,059
FAN HEATER
Huang Shih-Chuan, No. 182, Yung Fu Road, Sec. 2,, Tainan, Taiwan
Filed Mar. 31, 1988, Ser. No. 176,392
Term of patent 14 years
U.S. Cl. D23—335

311,060
MOBILE FIREWOOD CARRIER
Morgan Green, 162 Britannia Avenue, Bradford, Ontario, Canada (L3Z 1A5)
Filed Aug. 6, 1987, Ser. No. 82,185
Term of patent 14 years
U.S. Cl. D23—410



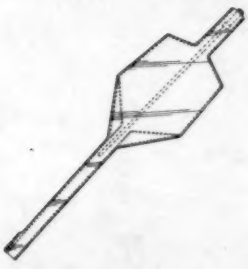
311,061
AIR SEPARATOR
Edward E. Vrana, West Seneca, and Ravinder K. Bansal, East Amherst, both of N.Y., assignors to AirSep Corporation, Buffalo, N.Y.
Filed Sep. 21, 1987, Ser. No. 98,901
Term of patent 14 years
U.S. Cl. D24—8

311,062
HOUSING FOR MEDICAL INSTRUMENT
John R. Nelson, Broken Arrow, Okla., assignor to Invivo Research, Inc.
Filed Oct. 15, 1987, Ser. No. 109,249
Term of patent 14 years
U.S. Cl. D24—17

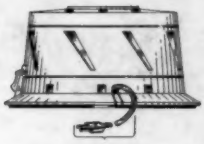


311,063
NURSING BOTTLE CAP
Jim D. Stephenson, West Hills, Calif., assignor to Degree Baby Products, West Hills, Calif.
Filed Oct. 11, 1988, Ser. No. 255,404
Term of patent 14 years
U.S. Cl. D24—47

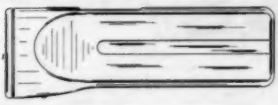
311,064
CATHETER PACKAGE
Jan M. R. Utas-Sjöberg, Mölndal, Sweden, assignor to Astra Meditec Aktiebolag, Mölndal, Sweden
Filed Feb. 2, 1987, Ser. No. 10,141
Claims priority, application Sweden, Aug. 11, 1986, 861827
Term of patent 14 years
U.S. Cl. D24—54

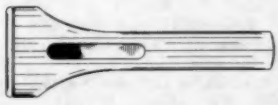


311,065
SOUND CONDITIONER FOR MASKING INTRUDING NOISES
David A. Theisen, Hampstead, and Robert L. Gault, Raleigh, both of N.C., assignors to Marpac Corporation, Wilmington, N.C.
Filed May 23, 1988, Ser. No. 197,415
Term of patent 14 years
U.S. Cl. D24—99

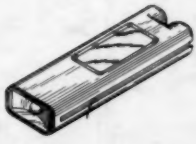


311,066
FLASHLIGHT
Kenneth R. Fenne, Glen Ellyn, Ill., assignor to Pittway Corporation, Northbrook, Ill.
Filed May 13, 1987, Ser. No. 49,084
Term of patent 14 years
U.S. Cl. D26—46

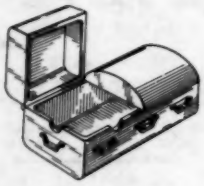




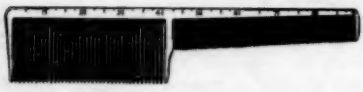
311,067
POCKET FLASHLIGHT
Paul R. Chabria, Wayne, Ill., assignor to Press-A-Lite Corporation, West Chicago, Ill.
Filed Oct. 18, 1988, Ser. No. 259,102
Term of patent 14 years
U.S. Cl. D26—46



311,068
ASHTRAY
Hennon Carson, 316 Wesley, Evanston, Ill. 60202
Filed Oct. 24, 1988, Ser. No. 261,185
Term of patent 14 years
U.S. Cl. D27—106

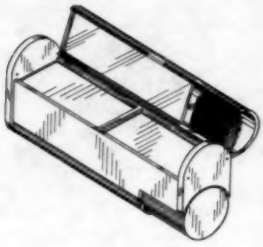


311,069
TWO-TIER COMB
Samuel J. Furco, 756 S. Crouse Ave., Syracuse, N.Y. 13210
Filed Jan. 11, 1988, Ser. No. 142,224
Term of patent 14 years
U.S. Cl. D28—28



311,070
BODY DRIER OR WARMER
Gene Blevins, Bremerton, Wash., assignor to Galaxy Machine Corporation, Redmond, Wash.
Filed Mar. 14, 1988, Ser. No. 167,424
Term of patent 14 years
U.S. Cl. D28—54.1

311,071
MAKE-UP CASE
Stefano Vanoncini, Milan, Italy, assignor to Brivaplast S.r.l., Milan, Italy
Filed Feb. 3, 1987, Ser. No. 10,578
Term of patent 14 years
U.S. Cl. D28—77

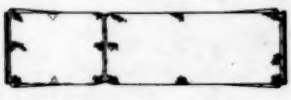


311,072
CAP FOR A COSMETIC CONTAINER
Giuseppe Martinoni, via B. Latini, 17/19, 20026 Novate Milanese (Milan), Italy
Filed Dec. 9, 1987, Ser. No. 130,721
Claims priority, application Italy, Jun. 26, 1987, 21901/87[U]
Term of patent 14 years
U.S. Cl. D28—84

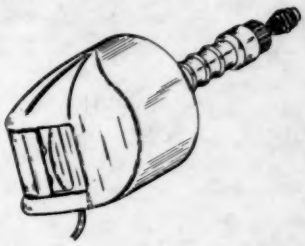
311,073
LIPSTICK CASE
Karena Bakic, Varese, Italy, assignor to Cosmede Anstalt, Vaduz, Liechtenstein
Filed Jan. 4, 1988, Ser. No. 140,328
Claims priority, application Fed. Rep. of Germany, Jul. 3, 1987, URA918/87
Term of patent 14 years
U.S. Cl. D28—85

311,074
EAR MUFF
Terry B. Scott, and Donna Scott, both of 110 Vick Dr., Brownwood, Tex. 76801
Filed Dec. 2, 1988, Ser. No. 280,193
Term of patent 14 years
U.S. Cl. D29—19

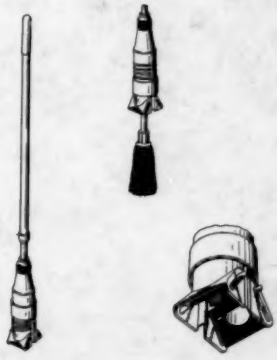
311,075
LIMB PROTECTOR
Alfred R. Pierce, Jr., 25 Argyle Ave., Blackwood, N.J. 08012
Filed Jul. 6, 1987, Ser. No. 70,232
Term of patent 14 years
U.S. Cl. D29—20



311,076
POWERED DRAIN CLEANER
Paul S. Kaye, Racine, Wis., assignor to Lewisan Products, Inc., Racine, Wis.
Filed Dec. 7, 1987, Ser. No. 129,076
Term of patent 14 years
U.S. Cl. D32—14



311,077
COMBINED MOP AND WRINGER
Kazuo Nakamura, and Yasuaki Keiko, both of Osaka, Japan, assignors to Yamazaki Corporation, Osaka, Japan
Filed Sep. 17, 1987, Ser. No. 98,054
Claims priority, application Japan, Jul. 23, 1987, 62-30294
Term of patent 14 years
U.S. Cl. D32—44

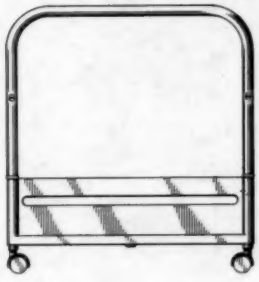


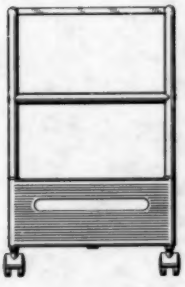
311,078
CLAMP FOR HOLDING SOCKS TOGETHER WHEN LAUNDERING
Wayne Holladay, and Barbara Holladay, both of 30 College Ave., Rexburg, Id. 83440
Filed Jun. 5, 1987, Ser. No. 58,751
Term of patent 14 years
U.S. Cl. D32—61

311,079
FOLDING GOLF CART
Larry D. Blake, Ogden, Utah, assignor to Wasatch Fiber Group, Inc., Ogden, Utah
Filed Jan. 19, 1988, Ser. No. 145,209
Term of patent 14 years
U.S. Cl. D34—15

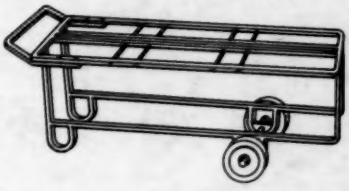
311,080
COMBINED COMPUTER MODULE AND CART THEREFOR
John Arnott; Donald H. Wilson; Gary Kaga, and Vincent Somoza, all of Toronto, Canada, assignors to Quantified Signal Imaging, Inc., Toronto, Canada
Filed Mar. 16, 1988, Ser. No. 168,757
Claims priority, application Japan, Nov. 9, 1987, 62-45745
Term of patent 14 years
U.S. Cl. D34—21

311,081
OFFICE CART
Mel Evenson, San Pedro, and Jerry Sharber, Cypress, both of Calif., assignors to Eldon Industries, Inc., Inglewood, Calif.
Filed Oct. 20, 1988, Ser. No. 260,362
Term of patent 14 years
U.S. Cl. D34—23

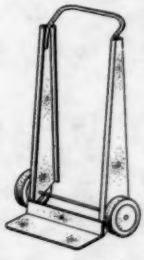




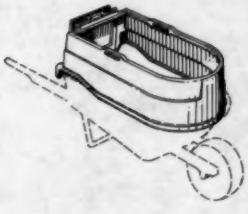
311,082
CART FOR REFUSE CONTAINERS
Michael D. Nordstrom, and Bob Armstrong, both of Waterloo, Iowa, assignors to Advanced Recycling Systems Inc., Waterloo, Iowa
Filed Oct. 20, 1988, Ser. No. 260,369
Term of patent 14 years
U.S. Cl. D34—24



311,083
HAND TRUCK
William A. Dutro, Eight Valley Ct., Orinda, Calif. 94563
Filed Feb. 22, 1988, Ser. No. 159,058
Term of patent 14 years
U.S. Cl. D34—26



311,084
WHEELBARROW TRAY EXTENDER
Bruce L. Batchelor, 23401 SW. 124 Ave., Homestead, Fla. 33032
Filed Dec. 1, 1988, Ser. No. 278,541
Term of patent 14 years
U.S. Cl. D34—27



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 2ND DAY OF OCTOBER, 1990

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

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Jordan, Willie W.; and McGraw, Brian J., 4,960,219, Cl. 215-354.000.

Abdellatifi, Nourddine: *See*—
Lesieur, Daniel; Abdellatifi, Nourddine; Aichaoui, Hocine; and Bonnet, Jacqueline, 4,960,778, Cl. 514-253.000.

Abe, Masao: *See*—
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Abe, Susan S.: *See*—
Talkington, Sherry R.; Abe, Susan S.; and Mijac, Marko D., 4,960,602, Cl. 426-534.000.

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Thelen, William G.; May, Rodney E.; and Gilbert, David L., 4,960,296, Cl. 285-50.000.
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Agfa-Gevaert AG: *See*—
Muller, Jurgen; Schmidt, Manfred; Wauer, Dieter; Zehetmaier, Thomas; Brys, Georges; Schoeters, Emile; Haug, Werner; and Bauer, Walter, 4,960,994, Cl. 250-327.200.

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Sellergren, Borje; Ekberg, Bjorn A.; Albertsson, Per-Ake; and Mosbach, Klaus, 4,960,762, Cl. 514-57.000.

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Shigyo, Masao; and Asai, Eiichi, 4,960,993, Cl. 250-327.200.

Asakura, Eizo: *See*—
Yoshinaka, Minoru; Asakura, Eizo; Oku, Mitsumasa; Hamabe, Takeshi; Kitano, Motoi; and Yoshida, Hideyuki, 4,960,654, Cl. 428-614.000.

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Miura, Satoshi; Nishimura, Masato; Itoh, Shigeki; and Asari, Takashi, 4,960,749, Cl. 503-213.000.

Asea Brown Boveri AB: *See*—
Bergsjo, Nils-Johan; and Liljestrand, Lars, 4,961,066, Cl. 338-32.00S.

Asea Brown Boveri Aktiengesellschaft: *See*—
Betz, Monika, 4,960,440, Cl. 48-197.00R.
Neumann, Adalbert; and Stumpf, Heinrich, 4,960,995, Cl. 250-347.000.

Asea Brown Boveri Ltd.: *See*—
Roggwiller, Peter, 4,961,099, Cl. 357-38.000.

Asea Brown Boveri Ltd: *See*—
Mechtersheimer, Gunter, 4,960,570, Cl. 422-186.210.

Ashida, Kazuhide, to Kabushiki Kaisha Toshiba. Programmable controller. 4,961,131, Cl. 364-140.000.

Ashok, Sankaranarayanan; and Watson, William G., to Olin Corporation. Process to produce oriented high temperature superconductors. 4,960,752, Cl. 505-1.000.

Ashton, Michael J.; Bridge, Andrew W.; Dron, Donald I.; Fenton, Garry; Lythgoe, David J.; Newton, Christopher G.; Riddell, David; Smith, Christopher; and Stuttle, Keith A. J., to May & Baker Limited. Pyrrolophthalazines. 4,960,775, Cl. 514-248.000.

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Lacks, Sanford A., 4,960,707, Cl. 435-320.000.

Astheimer, Hans; Friedmann, Hans; and Schuy, Hubert, to International Business Machines Corporation. Air bearing slider rail design with trumpet-shaped rail portion. 4,961,121, Cl. 360-103.000.

Asulab, S.A.: *See*—
Wiget, Fridolin, 4,960,000, Cl. 73-778.000.

AT&E Corporation: *See*—
Owen, Jeffrey R., 4,961,184, Cl. 370-76.000.

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Chandramouli, Bopsi; Epping, Gary L.; and Tripp, Susan J., 4,961,186, Cl. 370-79.000.
Chang, Chorng-Ping; Flamm, Daniel L.; Ibbotson, Dale E.; and Mucha, John A., 4,960,656, Cl. 428-704.000.
Dentini, Mark S.; Fulton, Joe A.; Jin, Sungho; Mottine, John J., Jr.; Shepherd, Lloyd; and Sherwood, Richard C., 4,960,612, Cl. 427-47.000.
Kostal, Hubert; Luhn, Rodney C.; and Smith, Donald E., 4,960,315, Cl. 350-96.180.

Atari Games Corporation: *See*—
Moncrief, Rick L.; and Durfey, Erik J., 4,960,117, Cl. 273-148.00B.

Atkinson, Arthur B. Door draft stopper. 4,959,927, Cl. 49-476.000.

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Duranel, Laurent; and Spitz, Roger, 4,960,744, Cl. 502-127.000.
Rousset, Abel; Maachi, Belaid; Gilot, Bernard; and Gougeon, Michel, 4,960,583, Cl. 423-633.000.

Atsugi Unisia Corp.: *See*—
Akasaka, Akio; Suga, Seiji; and Yasuda, Makoto, 4,960,084, Cl. 123-90.170.

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Chambers, James W., 4,960,288, Cl. 280-423.100.

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Augusteijn, Alexander; and Hopmans, Fransiscus P. M., to U.S. Philips Corporation. Method for operating a multiprocessor system for therein establishing a global binary assertion and a multiprocessor apparatus comprising synchronization means for such establishing, in particular for effecting a garbage collection operation. 4,961,137, Cl. 364-200.000.

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Opperthauser, Keith G., 4,960,201, Cl. 198-732.000.

Automotive Products plc: *See*—
LaFountain, Robert H., 4,959,960, Cl. 60-533.000.

Auweter, Helmut: *See*—
Mueller, Michael W.; Hoppe, Kalus-Dieter; Schwab, Ekkehard; Steck, Werner; Auweter, Helmut; and Feser, Rainer, 4,960,462, Cl. 75-252.000.

B.E.L-Tronics Limited: *See*—
Martinson, Glen, 4,961,074, Cl. 342-20.000.

B. F. Goodrich Company, The: *See*—
Amjad, Zahid; and Masler, William F., 4,960,522, Cl. 210-701.000.

Baasner, Bernd: *See*—
Beck, Gunther; Baasner, Bernd; Schwamborn, Michael; and Brandes, Wilheim, 4,960,899, Cl. 598-186.000.

Baba, Isao: *See*—
Komatsu, Masato; Isoi, Masaaki; Baba, Isao; and Mikami, Takashi, 4,960,823, Cl. 525-89.000.

Baba, Kenji; Watanabe, Shoji; Yahagi, Hayao; and Ogasawara, Hitoshi, to Hitachi, Ltd. Apparatus for sludge thickening. 4,960,512, Cl. 210-96.100.

Babczinski, Peter: *See*—
Jelich, Klaus; Babczinski, Peter; Santel, Hans-Joachim; Schmidt, Robert R.; and Strang, Harry, 4,960,455, Cl. 71-92.000.

Babin, Michel: *See*—
Gerard, Chevereau; and Babin, Michel, 4,960,561, Cl. 376-352.000.

Baehr, G. Geoffrey; and Rosenthal, Bert P. Telephone answering and paging system. 4,961,216, Cl. 379-57.000.

Baik, Woo H., to Goldstar Semiconductor, Ltd. Current-voltage converting circuit utilizing CMOS-type transistor. 4,961,009, Cl. 307-296.800.

Bailey, Almonte F. Variable rack for rising bread dough. 4,960,211, Cl. 211-60.100.

Bailly, Jean-Claude A.; and Sandis, Stylianos, to BP Chemicals Limited. Ziegler-Natta catalyst. 4,960,741, Cl. 502-10.000.

Baker Hughes Incorporated: *See*—
Cognevich, Michael L.; and Shirk, Steven H., 4,960,173, Cl. 166-241.000.

Bakish Materials Corporation: *See*—
Neuman, Manfred; ZeiBig, Gerhard; Ihle, Karl-Heinz; Madler, Eckerhard; Schiller, Siegfried; and Schroller, Rudolf, 4,960,607, Cl. 427-8.000.

Baldwin, Roger E.: *See*—
Owens, James C.; Baldwin, Roger E.; and Brophy, Chris P., 4,961,079, Cl. 346-108.000.

Baliga, Bantval J.; Chang, Hsueh-Rong; and Howell, Edward K., to General Electric Company. Bidirectional field effect semiconductor device and circuit. 4,961,100, Cl. 357-39.000.

Balistreri, Anthony M.: *See*—
Pinkham, Raymond; and Balistreri, Anthony M., 4,961,171, Cl. 365-230.050.

Bambrick, William E., to American Cyanamid Company. Method for making helically wound extrudate particles. 4,960,554, Cl. 264-219.000.

Banura, George A., to United States of America, Navy. MOSFET switching arrangement in a power converter unit. 4,961,048, Cl. 323-351.000.

Barclay, Edward M.: *See*—
Jarboe, Enos D.; Jarboe, Rodney D.; and Barclay, Edward M., 4,960,622, Cl. 428-15.000.

Bargfrede, Brent C.: *See*—
Roussin, Michael A.; and Bargfrede, Brent C., 4,959,915, Cl. 37-141.00R.

Bark, Tony L.: *See*—
Benesh, Yoel; and Bark, Tony L., 4,960,438, Cl. 44-589.000.

Barkesh Company, The: *See*—
Benesh, Yoel; and Bark, Tony L., 4,960,438, Cl. 44-589.000.

Barnett, Gabriel: *See*—
Hagen, Resheda; and Barnett, Gabriel, 4,960,592, Cl. 424-537.000.

Baron, Bruce M.: *See*—
Salituro, Francesco G.; Harrison, Boyd L.; and Baron, Bruce M., 4,960,786, Cl. 514-419.000.

Baroux, Bruno: *See*—
Signoret, Jacques; Fraisse, Jacques; Baroux, Bruno; and Carla, Francis, 4,960,249, Cl. 244-118.500.

Barraud, Roger: *See*—
Verdier, Claude; Leporcq, Bruno; Georges, Eric; and Barraud, Roger, 4,961,200, Cl. 372-89.000.

Bartels, Craig R.: *See*—
Pasternak, Mordechai; Bartels, Craig R.; Reale, John, Jr.; and Shah, Vatsal M., 4,960,519, Cl. 210-640.000.

Bartels, Gunter, to Hoechst Aktiengesellschaft. Process for the preparation of α-aminoalkylphosphonic acids and of α-aminoalkylphosphinic acids. 4,960,920, Cl. 558-170.000.

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Beck, Erich; Bronstert, Bernd; Huemmer, Wolfgang; and Littmann, Dieter, 4,960,673, Cl. 430-271.000.
Bergmann, Udo; Dix, Johannes D.; Hansen, Guenter; Schefczik, Ernst; and Seybold, Guenther, 4,960,874, Cl. 534-791.000.
Daltrozzo, Ewald; and Sulger, Werner, 4,960,890, Cl. 544-353.000.
Hansen, Guenter; Lamm, Gunther; Reichelt, Helmut; and Schefczik, Ernst, 4,960,873, Cl. 534-765.000.
Hoelderich, Wolfgang; and Goetz, Norbert, 4,960,894, Cl. 546-250.000.

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Meizer, Jaroslav, 4,960,361, Cl. 414-786.000.
Mueller, Michael W.; Hoppe, Kalus-Dieter; Schwab, Ekkehard; Steck, Werner; Auweter, Helmut; and Feser, Rainer, 4,960,462, Cl. 75-252.000.
Neubauer, Hans-Juergen; Buerstinghaus, Rainer; Kuenast, Christoph; and Hofmeister, Peter, 4,960,796, Cl. 514-624.000.
Portugall, Michael; Schumacher, Franz; and Seiler, Erhard, 4,960,552, Cl. 264-108.000.
Rentzea, Costin; Ammermann, Eberhard; and Lorenz, Gisela, 4,960,774, Cl. 514-239.200.

BASF K&F: *See*—
Eilerman, Robert; Christenson, Philip; Yurecko, John, Jr.; and Zebovitz, Thomas, 4,960,946, Cl. 568-376.000.

Bassett, H. Eugene. Rotary compressor for heavy duty gas services. 4,960,371, Cl. 418-13.000.

Basta, Michael: *See*—
Noce, Louis O.; and Basta, Michael, 4,960,127, Cl. 128-675.000.

Basu, Rajat S.: *See*—
Logadon, Peter B.; Stachura, Leonard M.; Swan, Ellen L.; and Basu, Rajat S., 4,960,535, Cl. 252-171.000.

Bau-Box Ewing: *See*—
Witschi, Heinz, 4,959,940, Cl. 52-583.000.

Bauer, Albert H.; and Shaw, Daniel C., to Bauer Industries, Inc. Apparatus and method for dispensing toweling. 4,960,248, Cl. 242-55.530.

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Bauer, Albert H.; and Shaw, Daniel C., 4,960,248, Cl. 242-55.530.

Bauer, Ralph: *See*—
Pellow, Scott W.; Trischuk, Ronald W.; Knapp, Christopher E.; and Bauer, Ralph, 4,960,441, Cl. 51-293.000.

Bauer, Walter: *See*—
Muller, Jurgen; Schmidt, Manfred; Wauer, Dieter; Zehetmaier, Thomas; Brys, Georges; Schoeters, Emile; Haug, Werner; and Bauer, Walter, 4,960,994, Cl. 250-327.200.

Baumeister, Peter; and Scherrer, Wilfried, to Ciba-Geigy Corporation. Process for the preparation of halogenated aromatic primary amines. 4,960,936, Cl. 564-417.000.

Baxter International, Inc.: *See*—
Bliem, Rudolf F.; and Long, James F., 4,960,706, Cl. 435-284.000.
Zowtiak, John M.; and Mayall, Bruce I., 4,960,708, Cl. 436-11.000.

Bayer Aktiengesellschaft: *See*—
Beck, Gunther; Baasner, Bernd; Schwamborn, Michael; and Brandes, Wilheim, 4,960,899, Cl. 598-186.000.
Bonse, Gerhard; Hallenbach, Werner; Lindel, Hans; and Berschauer, Friedrich, 4,960,783, Cl. 514-387.000.
Botta, Artur; Buysch, Hans-Josef; Puppe, Lothar; and Arlt, Dieter, 4,960,943, Cl. 568-319.000.
Daum, Werner; and Hanssler, Gerd, 4,960,768, Cl. 514-212.000.
Degen, Bruno; and Feldner, Kurt, 4,960,523, Cl. 210-721.000.
Eichenauer, Herbert; Leitz, Edgar; Ott, Karl-Heinz; and Pischtschan, Alfred, 4,960,822, Cl. 525-67.000.
Holmwood, Graham; Jager, Gerhard; Buchel, Karl H.; Brandes, Wilhelm; Dutzmann, Stefan; and Hanssler, Gerd, 4,960,453, Cl. 71-92.000.
Holmwood, Graham; Regel, Erik; Jager, Gerhard; Buchel, Karl H.; Lurssen, Klaus; Frohberger, Paul-Ernst; Brandes, Wilhelm; and Paul, Volker, 4,960,456, Cl. 71-92.000.
Holmwood, Graham; Kramer, Wolfgang; Regel, Erik; Elbe, Hans L.; Buchel, Karl H.; Dutzmann, Stefan; Brandes, Wilhelm; and Reinecke, Paul, 4,960,781, Cl. 514-383.000.
Jelich, Klaus; Babczinski, Peter; Santel, Hans-Joachim; Schmidt, Robert R.; and Strang, Harry, 4,960,455, Cl. 71-92.000.
Kloker, Werner; Freitag, Dieter; Uerdingen, Walter; Hess, Bernhard; and Schmid, Helmut, 4,961,179, Cl. 369-288.000.
Kohler, Burkhard; and Meyer, Rolf-Volker, 4,960,855, Cl. 528-211.000.
Kuhn, Rainer; Marhold, Albrecht; and Dicke, Hans-Rudolf, 4,960,539, Cl. 252-299.500.
Lindner, Christian; Wulff, Claus; and Ott, Karl-Heinz, 4,960,864, Cl. 528-486.000.
Scholl, Hans J.; and Pedain, Josef, 4,960,848, Cl. 528-48.000.
Wollweber, Detlef; and Brandes, Wilhelm, 4,960,789, Cl. 514-427.000.
Zerbes, Rudolf; Linke, Siegfried W.; Mohrmann, Karl H.; and Reiser, Wolf, 4,960,911, Cl. 549-519.000.

Beck, Erich; Bronstert, Bernd; Huemmer, Wolfgang; and Littmann, Dieter, to BASF Aktiengesellschaft. Photopolymerizable laminate suitable for producing printing plates. 4,960,673, Cl. 430-271.000.

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Beck, Irina: *See*—
Sebag, Henri; and Beck, Irina, 4,960,772, Cl. 514-231.200.

Bedell, Stephen A.; and Kirby, Larry H., to Dow Chemical Company, The. Removal of hydrogen sulfide with on site generated sulfite from geothermal steam. 4,960,575, Cl. 423-222.000.

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Beekenkamp, Gerald: *See*—
Kaufman, William H.; Gidman, Claude J.; Harrison, Frederick A.; and Beekenkamp, Gerald, 4,959,912, Cl. 36-117.000.

Behringwerke Aktiengesellschaft: *See*—
Kumpe, Gerhardt; Wormsbacher, Wilfried; Heimburger, Norbert; Fuhge, Peter; and Preis, Hans M., 4,960,757, Cl. 514-21.000.

Beinhaur, Ernest L.; and Porter, Joseph G., to AMP Incorporated. Hermetically sealed electrical bulkhead connector. 4,960,391, Cl. 439-559.000.

Belenky, Boris G.: *See*—
Alexandrov, Maxim L.; Belenky, Boris G.; Gotlib, Vladimir A.; Vlasov, Arkady P.; Komarov, Nikolai N.; Sudiiin, Valery V.; and Shevkunov, Vsevolod V., 4,960,516, Cl. 210-198.200.

Bell Communications Research, Inc.: *See*—
Lau, Chi-Leung, 4,961,188, Cl. 370-94.200.

Bell & Howell Company: *See*—
Frystak, Richard; O'Callaghan, John S., Sr.; and Colson, Jean-Jacques, 4,960,273, Cl. 271-10.000.

Bellamy, Francois: *See*—
Samreth, Soth; Bellamy, Francois; and Millet, Jean, 4,960,758, Cl. 514-24.000.

Belmark, Inc.: *See*—
Crane, John S.; and Strauss, Dean A., 4,960,482, Cl. 156-277.000.

Bendel, Bruce. Self-contained insert mailer. 4,960,237, Cl. 229-73.000.

Bendix, Dieter; and Entenmann, Gunther, to Boehringer Ingelheim Zentrale. Catalyst-free resorbable homopolymers and copolymers. 4,960,866, Cl. 528-499.000.

Benesh, Yoel; and Bark, Tony L., to Barkesh Company, The. Briquette an related process. 4,960,438, Cl. 44-589.000.

Benton, William M.; and Mee, William, to Moneyfax, Inc. Method of and system for electronic funds transfer via facsimile machines. 4,960,981, Cl. 235-379.000.

Beppu, Toshihiko: *See*—
Ishijima, Akira; Beppu, Toshihiko; and Kikuchi, Gunpei, 4,960,140, Cl. 134-31.000.

Berg, Hans: *See*—
Jannemann, Theo; and Berg, Hans, 4,960,378, Cl. 431-114.000.

Berg, James G.; and Reylek, Robert S., to Minnesota Mining and Manufacturing Company. Method of making multiple-connector adhesive tape. 4,960,490, Cl. 156-656.000.

Bergmann, Udo; Dix, Johannes D.; Hansen, Guenter; Schefczik, Ernst; and Seybold, Guenther, to BASF Aktiengesellschaft. Isothiazolylazo dyes having aminophenyl and aminonaphthyl components. 4,960,874, Cl. 534-791.000.

Bergsjo, Nils-Johan; and Liljestrand, Lars, to Asea Brown Boveri AB. Fault current limiter. 4,961,066, Cl. 338-32.00S.

Bergsma, Rudolph, to G. T. Products, Inc. Fuel tank vapor vent valve. 4,960,153, Cl. 137-587.000.

Bergstein, Frank D. Fluid flow driven engine. 4,960,363, Cl. 415-3.100.

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Bruggendick, Hermann; Weber, Raimond; Richter, Ekkehard; and Knoppik, Berthold, 4,960,447, Cl. 55-390.000.

Berkau, Eugene; Breen, Bernard; Gabrielson, James E.; and Winberg, Steve, to Consolidated Natural Gas Service Company, Inc. Low NOx burner operations with natural gas cofiring. 4,960,059, Cl. 110-347.000.

Berkey, George E., to Corning Incorporated. Capillary splice. 4,960,316, Cl. 350-96.210.

Bernat, Istvan: *See*—
Foldi, Tivadar; Bernat, Istvan; and Vogronics, Laszlo, 4,960,332, Cl. 356-376.000.

Bernhardt, Christian A.: *See*—
Kester, Jeffrey J.; Bernhardt, Christian A.; Elsen, Joseph J.; Letton, James A.; and Fox, Mary M., 4,960,600, Cl. 426-310.000.

Berry, James M.: *See*—
Nilsson, Richard C.; and Berry, James M., 4,960,318, Cl. 350-96.230.

Berschauer, Friedrich: *See*—
Bonse, Gerhard; Hallenbach, Werner; Lindel, Hans; and Berschauer, Friedrich, 4,960,783, Cl. 514-387.000.

Besenyei, Gabor: *See*—
Szalay, Erzsebet; Lugosi, Gyorgy; Kallay, Tamas U.; Nad, Zsuzsanna; Jelinek, Istvan; Simonidesz, Vilmos; Gyory, Peter; Nagy, Lajos; Lugosi, Marta; Santa nee Singola, Ilona; Besenyei, Gabor; and Simandi, Laszlo , 4,960,913, Cl. 552-206.000.

Betz, Monika, to Asea Brown Boveri Aktiengesellschaft. Process for reducing the quantity of undesired compounds in the generation of pyrolysis gas. 4,960,440, Cl. 48-197.00R.

Beverly Rodeo Development Corporation: *See*—
Dimijian, Berge A., 4,959,966, Cl. 62-138.000.

Bewley, Wilbur C.: *See*—
Werner, Kurt; Krieger, Leo G.; Bewley, Wilbur C.; and Tillman, Ennis L., 4,960,446, Cl. 55-312.000.

Bezier, Jean: *See*—
Vigneron, Gilbert; Bezier, Jean; Nguyen-Thanh, Thong; Vidal, Pierre; Zacharie, Guy; and Guillemin, Lucien, 4,960,650, Cl. 428-594.000.

Bezoari, Massimo D.: *See*—
Lo, Grace Y.; Otterbacher, Eric W.; Bezoari, Massimo D.; and Walther, Brian W., 4,960,842, Cl. 526-175.000.

Bhagat, Phiroz M.; Koros, Robert M.; Patel, Rutton D.; Peruyero, Jose M.; and Wyatt, John T., to Exxon Research and Engineering Company. Quench assembly design. 4,960,571, Cl. 422-194.000.

Biallas, Vesna: *See*—
Spitz, Richard; and Biallas, Vesna, 4,960,731, Cl. 437 152.000.

Bicksler, James J.: *See*—
Kreft, Anthony F., III; Musser, John H.; Bicksler, James J.; Giberson, John W.; and Kubrak, Dennis M., 4,960,892, Cl. 546-152.000.

Biczenczuk, Susan, to Courtaulds Films & Packaging (Holdings) Ltd. Polymeric films. 4,960,637, Cl. 428-314.400.

Bieber, Avigdor: *See—*
Pomerantz, Itzchak; Cohen-Sabban, Joseph; Bieber, Avigdor; Kamir, Josef; Katz, Mathew; and Nagler, Michael, 4,961,154, Cl. 364-522.000.

Bienkowski, Lynda J.: *See—*
Farbood, Mohamad I.; Morris, James A.; Sprecker, Mark A.; Bienkowski, Lynda J.; Miller, Kevin P.; Vock, Manfred H.; and Hagedorn, Myrna L., 4,960,597, Cl. 426-3.000.

Biere, Helmut; Huth, Andreas; Rahtz, Dieter; Schmiechen, Ralph; Seidelmann, Dieter; Stephens, David; Engelstoft, Mogens; and Hansen, John B., to Schering Aktiengesellschaft. Heteroaryloxy-β-carboline derivatives, their preparation and their use as medicinal agents. 4,960,777, Cl. 514-253.000.

Billet, Lucien; and Lebrun, Jean-Jacques, to Rhone-Poulenc Chimie. Production of diorganopolysiloxanes having silanol end groups. 4,960,850, Cl. 528-23.000.

Billman, Elizabeth R.: *See—*
Mehrotra, Pankaj K.; and Billman, Elizabeth R., 4,960,735, Cl. 501-89.000.

Billmyre, Richard D. Liquid recovery system. 4,960,515, Cl. 210-195.100.

Binder, Harmut, to Dr. Ing. h.c.F. Porsche AG. Holder for fastening at least one long round body. 4,960,252, Cl. 248-56.000.

Bisaccia, Emil: *See—*
Klainer, Albert S.; and Bisaccia, Emil, 4,960,408, Cl. 604-4.000.

Bishop, Clinton L.: *See—*
White, Jack D., Jr.; and Bishop, Clinton L., 4,960,476, Cl. 156-138.000.

Black Photo Corporation: *See—*
McDonald, Frank W., 4,961,093, Cl. 355-29.000.

Blakely, Calvin R.: *See—*
Vestal, Marvin L.; Blakely, Calvin R.; and Fergusson, Gordon J., 4,960,992, Cl. 250-288.000.

Blasko, Gabor: *See—*
Vedres, Andras; Szantay, Csaba; Stefko, Bela; Kreidl, Janos; Nemes, Andras; Blasko, Gabor; Bogsch, Erik; Mathe, Denes; Hegedus, Istvan; Szuchovszky, Adrien, nee Gergely; and Mester, Tamas, 4,960,888, Cl. 544-323.000.

Blevins, Charles H., II.: *See—*
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Blew, Douglas J.: *See—*
McDowell, Harvey R.; and Blew, Douglas J., 4,960,266, Cl. 254-134.3PA.

Bliem, Rudolf F.; and Long, James F., to Baxter International, Inc. Static oxygenator for suspension culture of animal cells. 4,960,706, Cl. 435-284.000.

Bloom, Gordon E., to Zenith Electronics Corporation. Push-pull zero-ripple IM converter system. 4,961,128, Cl. 363-16.000.

Blue, Joseph E.; and Watson, Thomas C., to United States of America, Navy. Low frequency sound source for acoustic sweeps. 4,961,175, Cl. 367-142.000.

Blytas, George C.; Diaz, Zaida; and Hart, William W. C., to Shell Oil Company. Water wash of olefin/carbon monoxide polymer. 4,960,865, Cl. 528-499.000.

Blytas, George C.: *See—*
Evans, Wayne E.; and Blytas, George C., 4,960,507, Cl. 208-254.00R.

BNR Inc.: *See—*
Gupta, Vijay K., 4,961,187, Cl. 370-85.120.

Board of Trustees operating Michigan State University: *See—*
Salam, Fathi M. A., 4,961,005, Cl. 307-201.000.

Bodouroglou, John, to Eschem Inc. Two-shot hot-melt bookbinding. 4,960,295, Cl. 281-15.100.

Boehringer Ingelheim Zentrale: *See—*
Bendix, Dieter; and Entenmann, Gunther, 4,960,866, Cl. 528-499.000.

Boenisch, Thomas. Closure and container for regent and slides. 4,960,224, Cl. 206-456.000.

Bogsch, Erik: *See—*
Vedres, Andras; Szantay, Csaba; Stefko, Bela; Kreidl, Janos; Nemes, Andras; Blasko, Gabor; Bogsch, Erik; Mathe, Denes; Hegedus, Istvan; Szuchovszky, Adrien, nee Gergely; and Mester, Tamas, 4,960,888, Cl. 544-323.000.

Boisson, Daniel: *See—*
Vieux, Gerard; Boisson, Daniel; de Groot, Paul; and Colomb, Gilbert-Rene , 4,960,608, Cl. 427-10.000.

Boles, Shawn M. Maze type device with optical component. 4,960,274, Cl. 272-8.00M.

Bolin, William D.; and Roper, Robert L., to Oryx Energy Company. Protection of gas engine or turbine from damage by changes in operating characteristics. 4,959,896, Cl. 290-40.00B.

Bolt Beranek and Newman Inc.: *See—*
Davis, Lawrence, 4,961,152, Cl. 364-513.000.

Bonnet, Jacqueline: *See—*
Lesieur, Daniel; Abdellatifi, Nourddine; Aichaoui, Hocine; and Bonnet, Jacqueline, 4,960,778, Cl. 514-253.000.

Bonse, Gerhard; Hallenbach, Werner; Lindel, Hans; and Berschauer, Friedrich, to Bayer Aktiengesellschaft. Use of benzimidazole derivatives as yield promoters. 4,960,783, Cl. 514-387.000.

Bontemps, Daniel, to STE Look. Safety device for the foot-holder of a sail board or the like. 4,960,063, Cl. 114-39.200.

Boot, Herbert W.: *See—*
Davies, John; and Boot, Herbert W., 4,959,977, Cl. 69-6.500.

Booth, D. A.: *See—*
Hazelton, Donald R.; Puydak, Robert C.; and Booth, D. A., 4,960,830, Cl. 525-196.000.

Borden, Inc.: *See—*
Walisser, Wayne R., 4,960,826, Cl. 524-494.000.

Borowiak, Herve: *See—*
Junino, Alex; Vandenbossche, Jean J.; Borowiak, Herve; and Lang, Gerard, 4,960,432, Cl. 8-411.000.

Borrod, Guy; and Gadras, Alain, to Rhone-Poulenc Agrochimie. Sulphonylurea-type herbicides. 4,960,454, Cl. 71-92.000.

Borror, Alan L.; and Ellis, Ernest W., to Polaroid Corporation. Thermal imaging method. 4,960,901, Cl. 548-207.000.

Bors, Daniel A.; and Emmons, William D., to Rohm and Haas Company. Mercaptoalkyl acetoacetates. 4,960,924, Cl. 560-178.000.

Bose, Amar G., to Bose Corporation. Wheel assembly suspending. 4,960,290, Cl. 280-692.000.

Bose Corporation: *See—*
Bose, Amar G., 4,960,290, Cl. 280-692.000.
Saffran, Richard E., 4,961,226, Cl. 381-24.000.

Botta, Artur; Buysch, Hans-Josef; Puppe, Lothar; and Arlt, Dieter, to Bayer Aktiengesellschaft. Process for the preparation of phenylketones etherified in the 4-position. 4,960,943, Cl. 568-319.000.

Bottinick, Martin; and Bottinick, Miriam. Animal shield. 4,960,293, Cl. 280-749.000.

Bottinick, Miriam: *See—*
Bottinick, Martin; and Bottinick, Miriam, 4,960,293, Cl. 280-749.000.

Bourzai, Jean-Dominique; Capet, Marc; Cotrel, Claude; Labaudiniere, Richard; Pitchen, Philippe; and Roussel, Gerard, to Rhone-Poulenc Sante. Pyrrole derivatives, and pharmaceutical compositions which contain them and pharmacological methods of use. 4,960,779, Cl. 514-300.000.

Bouse, James R.; and Conner, John P., to Component Hardware Group, Inc. Double action latch. 4,960,297, Cl. 292-223.000.

Bowne, Arlyce T., to Eastman Kodak Company. Color photographic element and process. 4,960,685, Cl. 430-505.000.

Boxus, Emile P.: *See—*
Paques, Marc; and Boxus, Emile P., 4,960,703, Cl. 435-240.450.

Boyer, Jean-Francois: *See—*
Debregeas, Patrice; Leduc, Gerard; and Boyer, Jean-Francois, 4,960,596, Cl. 424-458.000.

Boyko, Christina M.; Johnston, Craig N.; Loomis, James R.; Samuelson, Carl E.; and Schumacher, Ricahrd A., to International Business Machines Corporation. Epoxy composition of increased thermal conductivity and use thereof. 4,960,634, Cl. 428-220.000.

BP Chemicals Limited: *See—*
Bailly, Jean-Claude A.; and Sandis, Stylianos, 4,960,741, Cl. 502-10.000.
Canonge, Michel; and Joly, Jean C., 4,960,927, Cl. 560-234.000.

Brackenridge, David R., to Ethyl Corporation. Selective dehydrobromination. 4,960,962, Cl. 570-200.000.

Bradshaw, Jerald S.; Izatt, Reed M.; and Christensen, Virginia B., to Brigham Young University. Proton ionizable macrocyclic compounds. 4,960,882, Cl. 540-468.000.

Bramerdorfer, Heinz: *See—*
Rametsteiner, Hermann; Schwaha, Karl; Hirschmanner, Franz; and Bramerdorfer, Heinz, 4,960,164, Cl. 164-480.000.

Bramwell, Jonathan R.: *See—*
Tomlinson, Martin; and Bramwell, Jonathan R., 4,961,206, Cl. 375-39.000.

Brandes, Wilheim: *See—*
Beck, Gunther; Baasner, Bernd; Schwamborn, Michael; and Brandes, Wilheim, 4,960,899, Cl. 598-186.000.

Brandes, Wilhelm: *See—*
Holmwood, Graham; Jager, Gerhard; Buchel, Karl H.; Brandes, Wilhelm; Dutzmann, Stefan; and Hanssler, Gerd, 4,960,453, Cl. 71-92.000.
Holmwood, Graham; Regel, Erik; Jager, Gerhard; Buchel, Karl H.; Lursen, Klaus; Frohberger, Paul-Ernst; Brandes, Wilhelm; and Paul, Volker, 4,960,456, Cl. 71-92.000.
Holmwood, Graham; Kramer, Wolfgang; Regel, Erik; Elbe, Hans L.; Buchel, Karl H.; Dutzmann, Stefan; Brandes, Wilhelm; and Reinecke, Paul, 4,960,781, Cl. 514-383.000.
Wollweber, Detlef; and Brandes, Wilhelm, 4,960,789, Cl. 514-427.000.

Branson Ultrasonics Corporation: *See—*
Sager, Thomas B., 4,959,895, Cl. 28-282.000.

Brazdil, James F.: *See—*
Suresh, Dev. D.; Grasselli, Robert K.; Ratka, Frances I.; and Brazdil, James F., 4,960,921, Cl. 558-325.000.

Breen, Bernard: *See—*
Berkau, Eugene; Breen, Bernard; Gabrielson, James E.; and Winberg, Steve, 4,960,059, Cl. 110-347.000.

Breuer, Rudolf; and Brunner, Hubert, to AGFA-GEVAERT Aktiengesellschaft. Magnetic tape cassette having a sliding closure member that locks the winding hubs. 4,961,124, Cl. 360-132.000.

Bricker, Maureen L., to Allied-Signal Inc. Palladium containing catalyst for treatment of automotive exhaust. 4,960,574, Cl. 423-213.500.

Bridge, Andrew W.: *See—*
Ashton, Michael J.; Bridge, Andrew W.; Dron, Donald I.; Fenton, Garry; Lythgoe, David J.; Newton, Christopher G.; Riddell, David; Smith, Christopher; and Stuttle, Keith A. J., 4,960,775, Cl. 514-248.000.

Bridgestone Corporation: *See*—
Masuda, Yoshitomo; Ogawa, Masao; Arai, Katsuhiko; Suzuki, Kinya; Fuse, Tadashi; and Amano, Tetsuro, 4,960,657, Cl. 429-194.000.

Brierley, David; and Leaver, Alan T., to Imperial Chemical Industries plc. Azo disperse dye mixture giving bright blue shades on polyester textiles. 4,960,434, Cl. 8-524.000.

Briggs, Robert C.; Weber, Robert N.; and Hoffer, John C., to AMP Incorporated. Wall outlet for a fiber optic connector assembly. 4,960,317, Cl. 350-96.210.

Brigham Young University: *See*—
Bradshaw, Jerald S.; Izatt, Reed M.; and Christensen, Virginia B., 4,960,882, Cl. 540-468.000.
Perkins, Raymond T.; Thorne, James M.; Knight, Larry V.; and Woodbury, Richard C., 4,960,486, Cl. 156-633.000.

Brink, Egon: *See*—
Anstotz, Helmut; and Brink, Egon, 4,960,046, Cl. 100-93.0RP.

Bristol-Myers Company: *See*—
Nishio, Maki; Kakushima, Masatoshi; Konishi, Masataka; and Oki, Toshikazu, 4,960,755, Cl. 514-8.000.

British Gas plc: *See*—
Monrose, Russell J., 4,960,155, Cl. 138-178.000.

British United Shoe Machinery Ltd.: *See*—
Davies, John; and Boot, Herbert W., 4,959,977, Cl. 69-6.500.

Brokken, Kyle A., to Quali Tech, Inc. Method of supplying nutrients to plants. 4,960,452, Cl. 71-26.000.

Bronstert, Bernd: *See*—
Beck, Erich; Bronstert, Bernd; Huemmer, Wolfgang; and Littmann, Dieter, 4,960,673, Cl. 430-271.000.

Brooks, David W.: *See*—
Gummer, Allen L.; Choinski, Graydon J.; and Brooks, David W., 4,960,036, Cl. 92-63.000.

Brooks, Gary T.; Connolly, Brian C.; and Riley, Robert, to Amoco Corporation. Process for preparing polyamide-imide foam. 4,960,549, Cl. 264-45.500.

Brooks, Ralf M.; Kallin, Fredrik L. N.; Marshall, Gary R.; and Reid, Bruce A., to NCR Corporation. Apparatus and method for calibrating printing at a specified distance from a document edge. 4,960,336, Cl. 400-61.000.

Brophy, Chris P.: *See*—
Owens, James C.; Baldwin, Roger E.; and Brophy, Chris P., 4,961,079, Cl. 346-108.000.

Brother Kogyo Kabushiki Kaisha: *See*—
Kawanabe, Tasuku, 4,960,971, Cl. 219-69.120.

Brown, David K.: *See*—
Redmon, Daniel W.; and Brown, David K., 4,960,965, Cl. 174-102.00R.

Brown, Franklin I., to Ford Motor Company. Electrochromic, oxygen deficient metal oxide films provided by pyrolytic deposition. 4,960,324, Cl. 350-357.000.

Brown, Jeffrey K.: *See*—
Aiello, Salvatore F.; Brown, Jeffrey K.; Karasek, Donald F.; Lazzeroni, Edward J., Sr.; Lazzeroni, Edward J., Jr.; Quella, John F.; and Zollers, Timothy E., 4,959,923, Cl. 43-112.000.

Brown, Kenneth A.: *See*—
Thomas, Nils I.; Tien, Albert F.; and Brown, Kenneth A., 4,961,025, Cl. 313-524.000.

Brown, Oliver M., to S. C. Johnson & Son, Inc. Floor polishing composition. 4,960,463, Cl. 106-11.000.

Brown, Sidney L., to Wade Manufacturing Co. Adjustable emitter for heap leach mining percolation system and method. 4,960,584, Cl. 423-658.500.

Browne, Fredrick D.; and Martin, Jacob H., to Charles Stark Draper Laboratory, Inc., The. System for monitoring a liquid entrained in a fluid. 4,959,965, Cl. 62-129.000.

Browning, James A. Wire feed system for flame spray apparatus having increased wire. 4,960,458, Cl. 427-423.000.

Bruck, Gerald J.; Hilgert, Raymond A.; and Whitlow, Graham A., to Westinghouse Electric Corp. Anisotropic resistivity material and method of making same. 4,960,472, Cl. 148-127.000.

Bruggendick, Hermann; Weber, Raimond; Richter, Ekkehard; and Knoppik, Berthold, to Bergwerksverband GmbH. Reactor with moving layer for the removal of undesirable gaseous components from gases. 4,960,447, Cl. 55-390.000.

Brunken, Dean E.: *See*—
Stout, Mike F.; Brunken, Dean E.; and Hagen, Arnulf P., 4,960,615, Cl. 427-160.000.

Brunner, Hubert: *See*—
Breuer, Rudolf; and Brunner, Hubert, 4,961,124, Cl. 360-132.000.

Brunnhuber, Egon: *See*—
Stritzl, Karl; Hoffmann, Kurt; Freisinger, Henry; Janisch, Andreas; Brunnhuber, Egon; Zotter, Johann; Spitaler, Egelbert; Wladar, Helmut; Muhlberger, Reinhard; and Dapeci, Karl, 4,960,289, Cl. 280-630.000.

Brunot, Frank A.: *See*—
Gordon, Deborah C.; and Brunot, Frank A., 4,960,128, Cl. 128-677.000.

Brunswick Corporation: *See*—
Potratz, Douglas R., 4,960,398, Cl. 440-53.000.

Brunswick Manufacturing Co., Inc.: *See*—
Hewson, Carl E., 4,960,133, Cl. 128-784.000.

Bryan, Avron I.; and Cushman, Michael R. System for monitoring and reporting the operability and calibration status of a pH sensor. 4,961,163, Cl. 364-550.000.

Bryan, Philip S.; Lambert, Patrick M.; Towers, Christine M.; and Jarrold, Gregory S., to Eastman Kodak Company. X-ray intensifying screen including a titanium activated hafnium dioxide phosphor containing samarium to reduce afterglow. 4,961,004, Cl. 250-483.100.

Brygger, Flemming: *See*—
Shemitz, Sylvan R.; and Brygger, Flemming, 4,961,127, Cl. 362-285.000.

Brys, Georges: *See*—
Muller, Jurgen; Schmidt, Manfred; Wauer, Dieter; Zehetmaier, Thomas; Brys, Georges; Schoeters, Emile; Haug, Werner; and Bauer, Walter, 4,960,994, Cl. 250-327.200.

Buchanan, Max F.: *See*—
Sullivan, Robert W.; Holder, Tommie J.; and Buchanan, Max F., 4,960,082, Cl. 123-43.00A.

Buchanan, Robert H., Jr., to National Steel Corporation. Building panel mounting system. 4,959,939, Cl. 52-462.000.

Buchbinder, Maurice, to Medtronic Versaflex, Inc. Low profile sterrable soft-tip catheter. 4,960,411, Cl. 604-95.000.

Buchel, Karl H.: *See*—
Holmwood, Graham; Jager, Gerhard; Buchel, Karl H.; Brandes, Wilhelm; Dutzmann, Stefan; and Hanssler, Gerd, 4,960,453, Cl. 71-92.000.
Holmwood, Graham; Regel, Erik; Jager, Gerhard; Buchel, Karl H.; Lurssen, Klaus; Frohberger, Paul-Ernst; Brandes, Wilhelm; and Paul, Volker, 4,960,456, Cl. 71-92.000.
Holmwood, Graham; Kramer, Wolfgang; Regel, Erik; Elbe, Hans L.; Buchel, Karl H.; Dutzmann, Stefan; Brandes, Wilhelm; and Reinecke, Paul, 4,960,781, Cl. 514-383.000.

Buckholz, Lawrence L., Jr.; Farbood, Mohamad I.; Kossiakoff, Nicolas; Scharpf, Lewis G.; and Seitz, Eugene W., to International Flavors & Fragrances Inc. Use of sclareolide in augmenting or enhancing the organoleptic properties of foodstuffs. 4,960,603, Cl. 426-536.000.

Buckhorn, Inc.: *See*—
Tabler, Charles P.; and Stein, Eric D., 4,960,207, Cl. 206-507.000.

Buckman Laboratories International, Inc.: *See*—
Hollis, C. George; and Rayudu, S. Rao, 4,960,590, Cl. 424-78.000.

Budzelaar, Petrus H. M.: *See*—
Van Doorn, Johannes A.; Wife, Richard L.; and Budzelaar, Petrus H. M., 4,960,747, Cl. 502-167.000.

Buerstinghaus, Rainer: *See*—
Neubauer, Hans-Juergen; Buerstinghaus, Rainer; Kuenast, Christoph; and Hofmeister, Peter, 4,960,796, Cl. 514-624.000.

Buffenoir, Marc; Pierret, Rene ; Hellegouarc'h, Jean; and Prost, Gerard, to Institut de Recherches de la Siderurgie Francaise. Device for protecting the poles of inductors and inductor equipped with such device. 4,960,967, Cl. 219-10.491.

Bunge Foods Corporation: *See*—
Crosby, Thomas G., 4,960,606, Cl. 426-602.000.

Buratty, John D. Circular saw accessory. 4,959,907, Cl. 30-388.000.

Burgess, Marvin J.; Wargowski, David A.; and Palka, Agnes M., to Amoco Corporation. Polyimide copolymers containing 4,4'-bis(p-aminophenoxy)biphenyl and siloxane diamine moieties. 4,960,846, Cl. 528-26.000.

Burke, Desmond C., to U.R. Engineering Pty. Ltd. Harvester for grapes. 4,959,950, Cl. 56-340.100.

Burkett, Jerry L.: *See*—
Arnold, Fred E.; and Burkett, Jerry L., 4,960,853, Cl. 528-183.000.
Arnold, Fred E.; and Burkett, Jerry L., 4,960,854, Cl. 528-183.000.
Arnold, Fred E.; and Burkett, Jerry L., 4,960,858, Cl. 528-337.000.
Arnold, Fred E.; and Burkett, Jerry L., 4,960,859, Cl. 528-342.000.

Burkhardt, Thomas, executor: *See*—
Obrist, Frank; Wankel, Felix H., deceased; Renz, Gerhard, executor; Meysen, Fried, executor; and Burkhardt, Thomas, executor, 4,960,370, Cl. 418-9.000.

Burnand, Richard P.; and Dodsworth, John. Tool insert. 4,959,929, Cl. 51-307.000.

Burroughs Wellcome Co.: *See*—
Hadfield, Susan G.; and Norrington, Franklin E. A., 4,960,713, Cl. 436-523.000.
Hadfield Susan G.; and Norrington, Franklin E. A., 4,960,714, Cl. 436-523.000.
Hadfield, Susan G.; and Norrington, Franklin E. A., 4,960,715, Cl. 436-523.000.

Burvee, Arvard C. Hopper extension device. 4,960,300, Cl. 296-34.000.

Butler, Donald E.; and Greenman, Barbara J., to Warner-Lambert Company. Gabapentin mohohydrate and a process for producing the same. 4,960,931, Cl. 562-507.000.

Butt, Sheldon H.; and Mahulikar, Deepak, to Olin Corporation. Metal packages having improved thermal dissipation. 4,961,106, Cl. 357-74.000.

Buxade, Antonio, to Laboratorios Vinas, S.A. Process for the preparation of an acexamic acid derivatives. 4,960,917, Cl. 556-131.000.

Buysch, Hans-Josef: *See*—
Botta, Artur; Buysch, Hans-Josef; Puppe, Lothar; and Arlt, Dieter, 4,960,943, Cl. 568-319.000.

C. F. Spiess & Sohn GmbH & Co.: *See*—
Spiess, Wolfram; and Himmelreich, Rolf, 4,960,933, Cl. 562-882.000.

Cabot Corporation: *See*—
Fife, James A.; and Hard, Robert A., 4,960,471, Cl. 148-20.300.

Cadotte, John E., to Filmtec Corporation. Treatment of composite polyamide membranes via substitution with amine reactive reagents. 4,960,517, Cl. 210-639.000.

Cadotte, John E.; and Racchini, Joel R., to FilmTec Corporation, The. Treatment of composite polyamide membranes with compatible oxidants. 4,960,518, Cl. 210-639.000.

Caffrey, Stephen F.: *See*—
Ingermann, Donald E.; Smith, Ronald L.; Caffrey, Stephen F.; and Steinhoff, Lonney J., 4,959,884, Cl. 15-302.000.
Cale, Albert D., Jr.: *See*—
Walsh, David A.; and Cale, Albert D., Jr., 4,960,776, Cl. 514-252.000.
California Institute of Technology: *See*—
Kendall, James M., Jr.; Wang, Taylor G.; and Elleman, Daniel D., 4,960,351, Cl. 425-6.000.
California Steel Industries, Inc.: *See*—
Tudor, Ernest C., 4,960,209, Cl. 206-597.000.
Campbell, Michael J., to Union Carbide Corporation. Membrane process and system for nitrogen production. 4,960,579, Cl. 423-351.000.
Cancer Diagnostics, Inc.: *See*—
Guirguis, Raouf A., 4,960,130, Cl. 128-760.000.
Canon Kabushiki Kaisha: *See*—
Kasuya, Michio; and Tomoda, Akihiro, 4,961,091, Cl. 355-321.000.
Mori, Hiromi; and Morimoto, Reiko, 4,960,669, Cl. 430-137.000.
Nakagiri, Takashi; Nishimura, Yukuo; Sakai, Kunihiro; Tomida, Yoshinori; Eguchi, Ken; and Saito, Kenji, 4,960,679, Cl. 430-335.000.
Nishimura, Matsuomi, 4,960,070, Cl. 118-658.000.
Tohma, Koichi; Hasegawa, Tetsuo; Kushida, Naoki; Tamura, Yasuyuki; Yaegashi, Hisao; and Suzuki, Takayuki, 4,960,632, Cl. 428-212.000.
Canonge, Michel; and Joly, Jean C., to BP Chemicals Limited. Process for the continuous preparation of acetates. 4,960,927, Cl. 560-234.000.
Canosi, Umberto; De Fazio, Gabriele; and Villa, Stefano, to Istituto di Ricerca Cesare Serono SpA. Method of cleavage at methionine of polypeptides. 4,960,868, Cl. 530-389.000.
Capet, Marc: *See*—
Bourzai, Jean-Dominique; Capet, Marc; Cotrel, Claude; Labaudiniere, Richard; Pitchen, Philippe; and Roussel, Gerard, 4,960,779, Cl. 514-300.000.
Cappell, Mitchell G.; and Stephens, Malcolm. Programmable pushbutton combination lock. 4,959,978, Cl. 70-25.000.
Car-O-Liner Company: *See*—
Andersson, Thorbjorn B., 4,959,991, Cl. 72-457.000.
Carbochem Inc.: *See*—
Kremer, Henry A., 4,960,532, Cl. 252-88.000.
Card, Howard: *See*—
McLeod, Robert; Card, Howard; Hortensius, Peter; and Pries, Werner, 4,961,159, Cl. 364-717.000.
Carder, Timothy J., to Smiths Industries Public Limited Company. Electrical power control apparatus and methods. 4,961,047, Cl. 323-322.000.
Carenzi, Angelo; Chiarino, Dario; Della Bella, Davide; Grancini, Gian Carlo; and Veneziani, Carlo, to Zambon Group S.p.A. Pyrrolidone-2 compounds and their use for central analgesic activity. 4,960,788, Cl. 514-424.000.
Carl-Zeiss-Stiftung: *See*—
Liegel, Jurgen; and Krautter, Martin, 4,961,001, Cl. 250-491.100.
Weyrauch, Adolf, 4,959,908, Cl. 33-245.000.
Carla, Francis: *See*—
Signoret, Jacques; Fraisse, Jacques; Baroux, Bruno; and Carla, Francis, 4,960,249, Cl. 244-118.500.
Carlstedt, Richard A., to Miner Enterprises, Inc. Friction elastomer draft gear. 4,960,215, Cl. 213-33.000.
Carney, Donald R.; and Fisher, Daniel. Meat slicer. 4,960,021, Cl. 83-120.000.
Carrier, George F.: *See*—
Lapidus, Herbert; and Carrier, George F., 4,960,077, Cl. 119-106.000.
Carroll, W. Eamon; and Motika, Stephen A., to Air Products and Chemicals, Inc. Regeneration of metallo-organic catalyst for carbon dioxide-epoxide copolymerization. 4,960,862, Cl. 528-405.000.
Carson, John R., to McNeilab, Inc. Methods for the treatment of angina. 4,960,798, Cl. 514-654.000.
Carter, James I. Finned tube and method of making the same. 4,960,170, Cl. 165-184.000.
Cascade Microtech, Inc.: *See*—
Harwood, Warren K.; Jones, Keith E.; and DeLessert, Daniel, 4,961,050, Cl. 324-158.00F.
Casciani, Robert V., to Sandoz Ltd. Carboxyalkylated derivatives of alkyl and alkenyl catechol ethoxylates and detergent compositions containing same. 4,960,536, Cl. 252-174.190.
Cash, Howard S.: *See*—
Johal, Sajit S.; and Cash, Howard S., 4,960,697, Cl. 435-101.000.
Casio Computer Co., Ltd.: *See*—
Suzuki, Hiroyuki, 4,961,126, Cl. 361-398.000.
Caspian International, Inc.: *See*—
Doble, Florimel; Gallego, Jose M.; Steidl, El; and Jaffari, Cyrus, 4,960,511, Cl. 210-96.100.
Castro, Hernan A.: *See*—
Tam, Simon M.; Holler, Mark A.; and Castro, Hernan A., 4,961,002, Cl. 307-201.000.
Castro, Valentine A.: *See*—
Nelson, James E.; Castro, Valentine A.; and Esparza, Noemi, 4,960,121, Cl. 128-206.240.
Catalano, Marc L. Method of using bilumen peripheral venous catheter with adapter. 4,960,409, Cl. 604-53.000.
Catallo, Frank. Apparatus for a preshrinking arrangement to heat the fabric at a controlled temperature. 4,959,893, Cl. 26-18.600.
Caterpillar Inc.: *See*—
Roussin, Michael A.; and Bargfrede, Brent C., 4,959,915, Cl. 37-141.00R.
Cedar Works, Inc., The: *See*—
Obenshain, James R., 4,960,255, Cl. 248-156.000.
Cedar, Yoram: *See*—
Shubat, Alexander; and Cedar, Yoram, 4,961,172, Cl. 365-230.060.
Central Glass Company, Limited: *See*—
Eonomoto, Takamitsu; Ueda, Hiroshi; Kawahara, Midori; Okada, Naoki; and Murata, Noboru, 4,960,551, Cl. 264-65.000.
Century International Corporation: *See*—
Ingermann, Donald E.; Smith, Ronald L.; Caffrey, Stephen F.; and Steinhoff, Lonney J., 4,959,884, Cl. 15-302.000.
Cesare, Frank C.: *See*—
Allen, Ralph D.; Thiruvengada, Seshan; Cesare, Frank C.; and Visser, Harry D., 4,960,829, Cl. 525-193.000.
Cesaro, Attilio: *See*—
Molteni, Giuseppe; Nicora, Carlo; Cesaro, Attilio; and Pricl, Sabrina, 4,960,876, Cl. 536-114.000.
Chabata, Sueji: *See*—
Hanaoka, Kazuo; Chabata, Sueji; Koike, Michio; and Tsuboi, Takao, 4,960,641, Cl. 428-383.000.
Chaffee, Edwin G., to American Laser Corporation. Single line laser and method. 4,961,202, Cl. 372-100.000.
Chambers, James W., to Atwood Industries, Inc. Mounting for fifth wheel hitch. 4,960,288, Cl. 280-423.100.
Chambers, Stephen H.: *See*—
Pettigrew, Robert M.; Chambers, Stephen H.; and Davies, Dafydd G., 4,960,651, Cl. 428-607.000.
Chandramouli, Bopsi; Eppling, Gary L.; and Tripp, Susan J., to AT&T Bell Laboratories. Communication channel reallocation. 4,961,186, Cl. 370-79.000.
Chang, Chorng-Ping; Flamm, Daniel L.; Ibbotson, Dale E.; and Mucha, John A., to AT&T Bell Laboratories. Devices and process for producing devices containing silicon nitride films. 4,960,656, Cl. 428-704.000.
Chang, Hsueh-Rong: *See*—
Baliga, Bantval J.; Chang, Hsueh-Rong; and Howell, Edward K., 4,961,100, Cl. 357-39.000.
Chang, Jun H.: *See*—
Roush, David M.; Shaw, Donald A.; Jones, Michael L.; and Chang, Jun H., 4,960,884, Cl. 514-721.000.
Chang, Mei: *See*—
Law, Kam S.; Leung, Cissy; Tang, Ching C.; Collins, Kenneth S.; Chang, Mei; Wong, Jerry Y. K.; and Wang, David Nin-Kou, 4,960,488, Cl. 156-643.000.
Charles Stark Draper Laboratory, Inc., The: *See*—
Browne, Fredrick D.; and Martin, Jacob H., 4,959,965, Cl. 62-129.000.
Chatterjee, Ananda M.; and Wilpers, Dale J., to Shell Oil Company. Post-reactor stabilization of polyolefins. 4,960,617, Cl. 427-222.000.
Cheetham, Eric, to Phoenix Environmental Ltd. Method and apparatus for the reduction of solid waste material using coherent radiation. 4,960,380, Cl. 432-175.000.
Chef'N Corporation: *See*—
Holcomb, David A., 4,960,024, Cl. 83-423.000.
Chen, Ching-Fei. Erasable ink composition. 4,960,464, Cl. 106-19.000.
Chevron Corporation: *See*—
Lansford, Jerry R., 4,960,443, Cl. 55-45.000.
Chi, Yi-Chen. Stop washer for a brake unit of a bicycle. 4,960,187, Cl. 188-24.120.
Chi, Yi-Chen. Coupling for securing a handlebar to a bicycle frame. 4,960,342, Cl. 403-24.000.
Chianelli, Russell R.: *See*—
Halbert, Thomas R.; Stiefel, Edward I.; Chianelli, Russell R.; and Ho, Teh C., 4,960,506, Cl. 208-215.000.
Chiang, Ming-yao: *See*—
Chiang, Pei-Lieh; and Chiang, Ming-yao, 4,960,223, Cl. 220-7.000.
Chiang, Pei-Lieh; and Chiang, Ming-yao. Box crate container. 4,960,223, Cl. 220-7.000.
Chiarino, Dario: *See*—
Carenzi, Angelo; Chiarino, Dario; Della Bella, Davide; Grancini, Gian Carlo; and Veneziani, Carlo, 4,960,788, Cl. 514-424.000.
Chiba, Manabu: *See*—
Kawabata, Juheiji; Chiba, Manabu; Sugie, Toshinori; Kobata, Fumihiro; Izutsu, Hitoshi; Inoue, Toshio; and Mine, Takayuki, 4,960,841, Cl. 525-537.000.
Chiba, Masaaki; and Maruhashi, Hideki, to Mitsubishi Denki Kabushiki Kaisha. Diaphragm device. 4,960,038, Cl. 92-98.00R.
Chihara, Shuichi; Kanno, Ryuta; and Okuma, Akitoshi, to Sony Corporation. Holding structure for displaying apparatus. 4,960,256, Cl. 248-284.000.
Ching, Shanfun: *See*—
Gordon, Julian; McMahon, Michael E.; and Ching, Shanfun, 4,960,691, Cl. 435-6.000.
Chinoin Gyogyszer es Vegyeszeti Termekek Gyara Rt.: *See*—
Ecsery, Zoltan, deceased; Knoll, Jozsef; Somfai, Eva; Torok, Zoltan; Szinnyei, Eva; and Mozsolics, Karoly, 4,960,797, Cl. 514-654.000.
Korbonits, Dezso ; Heja, Gergely; Szomor, Maria; and Minker, Emil, 4,960,773, Cl. 514-234.210.
Szalay, Erzsebet; Lugosi, Gyorgy; Kallay, Tamas U.; Nad, Zsuzsanna; Jelinek, Istvan; Simonidesz, Vilmos; Gyory, Peter; Nagy, Lajos; Lugosi, Marta; Santa nee Singola, Ilona; Besenyei, Gabor; and Simandi, Laszlo , 4,960,913, Cl. 552-206.000.
Chiu, Chung-wai; and Chua, Hunter, to National Starch and Chemical Investment Holding Corporation. Oriental noodle prepared from a cross-linked potato or sweet potato starch. 4,960,604, Cl. 426-557.000.

Cho, Michio; Aosaki, Ko; and Sato, Tokuji, to Fuji Photo Film Co., Ltd. Lens fitted film package. 4,961,085, Cl. 354-295.000.

Cho, Thomas B., to Du Pont de Nemours, E. I., and Company. Process of making photographic silver halide element with backing layers with improved coating properties. 4,960,687, Cl. 430-527.000.

Choinski, Graydon J.: *See*—
Gummer, Allen L.; Choinski, Graydon J.; and Brooks, David W., 4,960,036, Cl. 92-63.000.

Chou, An-Chuan. Attachment device for strap end. 4,959,891, Cl. 24-265.00A.

Christensen, Virginia B.: *See*—
Bradshaw, Jerald S.; Izatt, Reed M.; and Christensen, Virginia B., 4,960,882, Cl. 540-468.000.

Christenson, Philip: *See*—
Eilerman, Robert; Christenson, Philip; Yurecko, John, Jr.; and Zebovitz, Thomas, 4,960,946, Cl. 568-376.000.

Christidis, Yani; and Sidot, Christian, to Societe Francaise Hoechst. Pure crystalline methyl 2-acryloylamino-2-methoxy acetate and a process for preparing IT. 4,960,923, Cl. 560-170.000.

Christner, Juergen; Pfleiderer, Ernst; and Taeger, Tilman, to Rohm GmbH. Method for liming skins and hides. 4,960,428, Cl. 8-94.180.

Christoff, James T.: *See*—
Teel, Willis A.; and Christoff, James T., 4,961,174, Cl. 367-97.000.

Chrysler Corporation: *See*—
Holda, Steven F.; Plonka, Francis E.; VandenBrossche, Daniel J.; and Felice, John S., 4,961,148, Cl. 364-468.000.

Chua, Hunter: *See*—
Chiu, Chung-wai; and Chua, Hunter, 4,960,604, Cl. 426-557.000.

Chuang, Kuo C. Plastic film cutter. 4,960,022, Cl. 83-175.000.

Ciaravino, Carlo G. Frontally "invisible" adjustable tie clasp. 4,959,889, Cl. 24-49.00R.

Ciba Corning Diagnostics Corp.: *See*—
Harvey, Michael A.; Manning, Brenda D.; Nicholson, Mary L.; Travis, Karen L.; and Luderer, Albert A., 4,960,716, Cl. 436-542.000.

Ciba-Geigy Corporation: *See*—
Baumeister, Peter; and Scherrer, Wilfried, 4,960,936, Cl. 564-417.000.
Cotting, Jacques-Alain; and Renner, Alfred, 4,960,840, Cl. 525-521.000.
Husler, Rinaldo; Rutsch, Werner; Rembold, Manfred; and Sitek, Franciszek, 4,960,746, Cl. 502-153.000.
Lehmann, Urs, 4,960,870, Cl. 534-619.000.
Nagy, Ingrid E., 4,960,799, Cl. 514-567.000.
Wasley, Jan W. F., 4,960,787, Cl. 514-423.000.

Cime Bocuze: *See*—
Nicolas, Guy, 4,960,563, Cl. 419-23.000.

Citizen Watch Co., Ltd.: *See*—
Kato, Toshikiyo; Ichikawa, Yasuo; Ito, Wataru; Ikeda, Hiroshi; and Kamata, Yoshio, 4,960,337, Cl. 400-248.000.

CIWJ Compagnie Internationale du Water Jet: *See*—
Loegel, Charles; Durr, Isabelle; Reichert, Sylvie; Loegel, Patrick; and Schneider, Francine, 4,960,176, Cl. 175-424.000.

Clark, Peter F.: *See*—
Scott, Alistair; and Clark, Peter F., 4,960,261, Cl. 251-148.000.

Clark, Robin D., to Syntex (U.S.A.) Inc. Process for the preparation of decahydro-8H-isoquino[2,1-G][1,6]naphthyridine derivatives. 4,960,891, Cl. 546-48.000.

Clausen, Thomas; and Rose, David, to Wella Aktiengesellschaft. Process for making 4-chloro-2-methyl-5-nitro-phenol. 4,960,955, Cl. 568-709.000.

Clemens, Donald L.: *See*—
Jordan, William D.; and Clemens, Donald L., 4,961,125, Cl. 361-383.000.

Clorox Company, The: *See*—
Steichen, Dale S.; Ku, Hao; and Lewis, Sheldon N., 4,960,925, Cl. 560-193.000.

Cochrane, Ian R. Frame apparatus. 4,959,916, Cl. 40-603.000.

Cockrum, Charles A.: *See*—
Rosbeck, Joseph P.; and Cockrum, Charles A., 4,961,098, Cl. 357-30.000.

Codon: *See*—
Rice, Craig; Morser, Michael J.; Glaser, Charles; and Donner, Peter A., 4,960,702, Cl. 435-226.000.

Cognevich, Michael L.; and Shirk, Steven H., to Baker Hughes Incorporated. Releasable well tool stabilizer. 4,960,173, Cl. 166-241.000.

Cohen-Sabban, Joseph: *See*—
Pomerantz, Itzchak; Cohen-Sabban, Joseph; Bieber, Avigdor; Kamir, Josef; Katz, Mathew; and Nagler, Michael, 4,961,154, Cl. 364-522.000.

Cole, Herbert S.; and Liu, Yung S., to General Electric Company. Laser interconnect process. 4,960,613, Cl. 427-53.100.

Coleman, Clarence B., to Fabricated Metals, Inc. Bulk material container with a flexible liner. 4,960,227, Cl. 222-94.000.

Colgate-Palmolive Company: *See*—
Wisniewski, Karen L.; and Knudson, Mary L., 4,960,533, Cl. 252-142.000.

Colgate-Polmolive Company: *See*—
Puentes-Bravo, Eduardo; Gillis, Marcel; and Somers, Andreas J., 4,960,526, Cl. 252-8.800.

Colla, Jeannine O.: *See*—
Fudim, Efrem V.; and Colla, Jeannine O., 4,960,674, Cl. 430-284.000.

Collins, George J.; McNeil, John R.; and Yu, Zeng-gi. Magnetron deposition of ceramic oxide-superconductor thin films. 4,960,753, Cl. 505-1.000.

Collins, Kenneth S.: *See*—
Law, Kam S.; Leung, Cissy; Tang, Ching C.; Collins, Kenneth S.; Chang, Mei; Wong, Jerry Y. K.; and Wang, David Nin-Kou, 4,960,488, Cl. 156-643.000.

Colom, Roberto C.; Duque Ros, Jordi J.; and Herrerq, Juan J. P., to Hispano Quimica, S.A. Chromium free process for the tanning of hides. 4,960,429, Cl. 8-94.260.

Colomb, Gilbert-Rene : *See*—
Vieux, Gerard; Boisson, Daniel; de Groot, Paul; and Colomb, Gilbert-Rene , 4,960,608, Cl. 427-10.000.

Colorado School of Mines: *See*—
McNeill, Harry L., 4,960,509, Cl. 209-164.000.

Colson, Jean-Jacques: *See*—
Frystak, Richard; O'Callaghan, John S., Sr.; and Colson, Jean-Jacques, 4,960,273, Cl. 271-10.000.

Combe Incorporated: *See*—
Lapidus, Herbert; and Carrier, George F., 4,960,077, Cl. 119-106.000.

Comet Technologies, Inc.: *See*—
Watson, Teddie G.; and Orth, Jeffrey, 4,960,437, Cl. 43-42.310.

Communications Research Laboratory, Ministry of Posts & Telecommunications: *See*—
Takahashi, Kozo; and Fujinawa, Yukio, 4,961,143, Cl. 364-421.000.

Compagnie Europeenne de Composants Electroniques LCC: *See*—
Grandjean, Daniel; Seurre, Jean-Michel; and Zastko, Didier, 4,961,060, Cl. 333-140.000.

Component Hardware Group, Inc.: *See*—
Bouse, James R.; and Conner, John P., 4,960,297, Cl. 292-223.000.

Conde, Robert V.: *See*—
Malinoski, David A.; and Conde, Robert V., 4,960,451, Cl. 65-3.200.

Congleton, Ray L.: *See*—
Machado, Octavio; Henry, Clifford W.; Congleton, Ray L.; and Flynn, William M., 4,960,560, Cl. 376-272.000.

Conlon, Brendan; Devine, James A.; and Dittmar, James A., to Criticare Systems, Inc. ECG synchronized pulse oximeter. 4,960,126, Cl. 128-633.000.

Conner, John P.: *See*—
Bouse, James R.; and Conner, John P., 4,960,297, Cl. 292-223.000.

Connolly, Brian C.: *See*—
Brooks, Gary T.; Connolly, Brian C.; and Riley, Robert, 4,960,549, Cl. 264-45.500.

Connolly, Timothy: *See*—
Greenway, John M.; Schortmann, Walter E.; Mancini, Peter; Metrick, Dennis; and Connolly, Timothy, 4,960,630, Cl. 428-131.000.

Connor, Margaret B.; and Tratnyek, Joseph P., to Koos, Inc. Ice melter comprising an alpha-methyl glucoside and method of making same. 4,960,531, Cl. 252-70.000.

Conserve, Inc.: *See*—
Harris, Kenneth J., 4,959,975, Cl. 62-238.600.

Consolidated Natural Gas Service Company, Inc.: *See*—
Berkau, Eugene; Breen, Bernard; Gabrielson, James E.; and Winberg, Steve, 4,960,059, Cl. 110-347.000.

Constance-Hughes, Trevor, to Siebe Gorman & Company Limited. Breathing apparatus. 4,960,120, Cl. 128-205.220.

Container Corporation of America: *See*—
Udell, Theodore H., 4,960,376, Cl. 425-525.000.

Conway, Michael F.: *See*—
Willis, Carl L.; Conway, Michael F.; and Martin, Michael K., 4,960,831, Cl. 525-250.000.

Coons, Terry L., to Tech Development Inc. Pneumatic and electro-pneumatic starters. 4,960,085, Cl. 123-179.00F.

Cooper, Gary L. Game call. 4,960,400, Cl. 446-207.000.

Cope, Samuel M. Disposable eye drop dispenser instrument for post-surgical and general use. 4,960,407, Cl. 604-300.000.

Corder, William O., Jr. Training device for golfers. 4,960,280, Cl. 273-189.00R.

Cordis Corporation: *See*—
Pinchuk, Leonard, 4,960,410, Cl. 604-96.000.

Cordova, Colleen W.; and Marshall, Robert M., to Allied-Signal Inc. Wet abrasion resistant yarn and cordage: aqueous finish with oxidized polyethylene and ammonium hydroxide. 4,960,431, Cl. 8-115.600.

Core-Vent Corporation: *See*—
Niznick, Gerald A., 4,960,381, Cl. 433-174.000.

Corghi Elethromeccanics S.p.A.: *See*—
Corghi, Remo, 4,960,034, Cl. 91-491.000.

Corghi, Remo, to Corghi Elethromeccanics S.p.A. Fluid-driven multi-cylinder operating unit tire removal machines. 4,960,034, Cl. 91-491.000.

Corning Incorporated: *See*—
Berkey, George E., 4,960,316, Cl. 350-96.210.
Guile, Donald L.; and Martin, Dandy, 4,960,737, Cl. 501-125.000.

Cotrel, Claude: *See*—
Bourzai, Jean-Dominique; Capet, Marc; Cotrel, Claude; Labaudiniere, Richard; Pitchen, Philippe; and Roussel, Gerard, 4,960,779, Cl. 514-300.000.

Cotting, Jacques-Alain; and Renner, Alfred, to Ciba-Geigy Corporation. Epoxidized modified acetophenone/formaldehyde resins. 4,960,840, Cl. 525-521.000.

Court, Nigel T.: *See*—
Smith, Brian D.; Court, Nigel T.; and Howsam, Christopher G., 4,960,383, Cl. 434-430.000.

Courtaulds Films & Packaging (Holdings) Ltd.: *See*—
Biczenczuk, Susan, 4,960,637, Cl. 428-314.400.

Covil, Donald M. All-season floating blanket. 4,959,877, Cl. 5-423.000.

Cowan, Jack C.: *See—*
House, Roy F.; Granquist, Victor M.; and Cowan, Jack C., 4,960,740, Cl. 501-148.000.

Cowger, Bruce, to Hewlett-Packard Company. Reliability improvement for ink jet pens. 4,961,076, Cl. 346-1.100.

Cozzini, Inc.: *See—*
Cozzini, Ivo; and Walker, Matthew, 4,960,599, Cl. 426-281.000.

Cozzini, Ivo; and Walker, Matthew, to Cozzini, Inc. Cold particle suspension and injection process for meat. 4,960,599, Cl. 426-281.000.

Crane, John S.; and Strauss, Dean A., to Belmark, Inc. Apparatus and method for manufacture of adhesive label. 4,960,482, Cl. 156-277.000.

Cranney, Don H.; and Maxfield, Blake T. Surfactant for gassed emulsion explosive. 4,960,475, Cl. 149-2.000.

Crapo, Clark C.; and Malpass, Dennis B., to Texas Alkyls, Inc. Synthesis of methylaluminoxanes. 4,960,878, Cl. 556-179.000.

Craxton, Stephen: *See—*
Skupsky, Stanley; Craxton, Stephen; and Soures, John, 4,961,195, Cl. 372-31.000.

Creative Capital Corp.: *See—*
Insley, Harold, 4,960,976, Cl. 392-485.000.

Cresci, Thomas R.: *See—*
Mavrakis, Stavros; and Cresci, Thomas R., 4,959,917, Cl. 42-90.000.

Criticare Systems, Inc.: *See—*
Conlon, Brendan; Devine, James A.; and Dittmar, James A., 4,960,126, Cl. 128-633.000.

Crosby, Thomas G., to Bunge Foods Corporation. Microbially-stable shortening containing butter. 4,960,606, Cl. 426-602.000.

Croucher, Melvin D.: *See—*
Wong, Raymond W.; Drappel, Stephan; and Croucher, Melvin D., 4,960,667, Cl. 430-114.000.

Cruchon, Jean-Claude; and Prost, Gilbert, to Alcatel N.V. Phase-shifting combiner for electromagnetic waves. 4,961,061, Cl. 333-156.000.

Crus, Richard A.; Haderle, Donald J.; and Teng, James Z., to International Business Machines Corporation. Method for minimizing locking and reading in a segmented storage space. 4,961,134, Cl. 364-200.000.

CTS Corporation: *See—*
Taylor, Eric B., 4,961,065, Cl. 338-308.000.

Cukier, Maurice; Pilost, Daniel; and Rigal, Dominique, to International Business Machines Corporation. Multiplexing system setting through mask registers. 4,961,189, Cl. 370-112.000.

Cullinan, Ann M.; and Schwartz, Paul A., to Eastman Kodak Company. Bleaching compositions containing a dye-stabilizing agent and use thereof in photographic color processing. 4,960,682, Cl. 430-393.000.

Cummins, Donald L., to AMF Machinery Systems, Inc. Method for pumping, homogenizing and dividing dough and the like. 4,960,601, Cl. 426-504.000.

Cummins Engine Company, Inc.: *See—*
O'Neill, Jeff S.; Schisler, H. Edmund; and Kubo, Isoroku, 4,960,080, Cl. 123-254.000.
Yonushonis, Thomas M., 4,960,449, Cl. 55-523.000.

Currie, Aaron D. Antenna signal device. 4,960,067, Cl. 116-28.00R.

Currie, Sara A.; Miller, Thomas W.; Dulaney, Eugene L.; Springer, James P.; Valiant, Mary E.; del Val, Sagrario M.; and Zimmerman, Sheldon B., to Merck & Co., Inc. Process for producing L-654,040, antibacterial agent. 4,960,698, Cl. 435-119.000.

Curtis, Lindy J.: *See—*
Poole, Jon M.; and Curtis, Lindy J., 4,960,459, Cl. 419-63.000.

Cushing, David H., to Optical Corporation of America. Broad band nonreflective neutral density filter. 4,960,310, Cl. 350-1.700.

Cushman, Michael R.: *See—*
Bryan, Avron I.; and Cushman, Michael R., 4,961,163, Cl. 364-550.000.

Daar, Yair; and Yahav, Shimon. Depilatory device. 4,960,421, Cl. 606-133.000.

Dagiantis, Christos, to American Standard Inc. Sanitary water valve. 4,960,154, Cl. 137-625.170.

Daiichi Seiyaku Co., Ltd.: *See—*
Hirota, Sadao; Kikuchi, Hiroshi; Yamauchi, Hitoshi; and Tomikawa, Munehiro, 4,960,595, Cl. 424-450.000.

Daikin Industries, Ltd.: *See—*
Horiuchi, Hitoshi, 4,960,365, Cl. 417-222.000.

Daimler-Benz AG: *See—*
Mauz, Lothar; and Gellner, Harald, 4,959,982, Cl. 70-248.000.

Daimler-Benz Aktiengesellschaft: *See—*
Hiereth, Hermann, 4,959,961, Cl. 60-612.000.

Dainippon Ink and Chemicals, Inc.: *See—*
Kawabata, Juheiji; Chiba, Manabu; Sugie, Toshinori; Kobata, Fumihiro; Izutsu, Hitoshi; Inoue, Toshio; and Mine, Takayuki, 4,960,841, Cl. 525-537.000.
Kotera, Kohichi; Sugie, Toshinori; Kobata, Fumihiro; Kawabata, Juheiji; and Hasegawa, Sugio, 4,960,861, Cl. 528-388.000.

Dalby, Glenn R.; and Heiland, Wolfgang K., to United States of America, Agriculture. Hydrocyclone for washing particles in liquid suspension. 4,960,525, Cl. 210-788.000.

Dale, Charles L. Hand splint for stroke patients. 4,960,114, Cl. 128-87.00R.

Dallas Handbag Company: *See—*
Morchower, Harry S., 4,960,233, Cl. 224-250.000.

Daltrozzo, Ewald; and Sulger, Werner, to BASF Aktiengesellschaft. Methine dyes which have at least one heterocycle containing two nitrogen atoms and preparation thereof. 4,960,890, Cl. 544-353.000.

Dana Corporation: *See—*
Kalazny, Andrzej J., 4,960,203, Cl. 198-802.000.
Kranis, Daniel, Sr., 4,959,986, Cl. 72-129.000.
Schultz, Donald C.; and Koedam, James G., 4,960,009, Cl. 74-473.00R.

Dana, Francis W.: *See—*
Gilliland, W. Keith; Midgley, Christian G.; Dana, Francis W.; and Mutch, Mark C., 4,961,088, Cl. 355-206.000.

Dango & Dienenthal Maschinenbau GmbH: *See—*
Schneider, Werner, 4,960,379, Cl. 432-3.000.

Danilewicz, John C.; and James, Keith, to Pfizer Inc. Cycloalkyl-substituted glutaramide diuretic agents. 4,960,792, Cl. 514-481.000.

Dankowych, John A., to Litton Systems, Inc. Active polarization control servo and method. 4,960,319, Cl. 350-96.290.

Danree, Bernard; Houziaux, Patrick; Lacolle, Jean-Yves; and Riffaud, Jean-Pierre, to Institut de Ercherches Chimiques et Biologiques Appliquees (I.R.C.E.B.A.). Oxyimino derivatives of thiazole, method of preparation and use in therapy. 4,960,900, Cl. 548-203.000.

Daoust, Gilbert; and Gingras, Michel. Citrus fruit pulp cutter. 4,959,903, Cl. 30-123.500.

Dapeci, Karl: *See—*
Stritzl, Karl; Hoffmann, Kurt; Freisinger, Henry; Janisch, Andreas; Brunnhuber, Egon; Zotter, Johann; Spitaler, Egelbert; Wladar, Helmut; Muhlberger, Reinhard; and Dapeci, Karl, 4,960,289, Cl. 280-630.000.

Dassance, Donald A.; and Feldborg, Richard E., to ACU-Crimp, Inc. Applicator die. 4,959,988, Cl. 72-421.000.

DataCard Corporation: *See—*
Lundstrom, Robert W.; and Sells, Robert A., 4,960,047, Cl. 101-27.000.

Daughton, John W.: *See—*
Rabb, Khalid M.; Sklut, Robert L.; and Daughton, John W., 4,961,092, Cl. 355-323.000.

Daum, Werner; and Hanssler, Gerd, to Bayer Aktiengesellschaft. Acyloxythiophene-carboxamide fungicides. 4,960,768, Cl. 514-212.000.

Dauvergne, Hector A. Lenticular eyewear and method of fabrication. 4,960,326, Cl. 351-41.000.

Davidson, Roger. Portable vehicle security lock with illumination means. 4,959,981, Cl. 70-238.000.

Davies, Dafydd G.: *See—*
Pettigrew, Robert M.; Chambers, Stephen H.; and Davies, Dafydd G., 4,960,651, Cl. 428-607.000.

Davies, John; and Boot, Herbert W., to British United Shoe Machinery Ltd. Machine for and method of performing a roughing operation progressively along marginal portions of a shoe bottom. 4,959,977, Cl. 69-6.500.

Davies, Robert B., to Motorola, Inc. Process for making a self aligned vertical field effect transistor having an improved source contact. 4,960,723, Cl. 437-41.000.

Davis, Herbert J.: *See—*
Rowlands, John A.; Araj, Naoum; and Davis, Herbert J., 4,961,209, Cl. 378-29.000.

Davis, Jeffrey B., to National Semiconductor Corporation. Output buffer for reducing switching induced noise. 4,961,010, Cl. 307-443.000.

Davis, Lawrence, to Bolt Beranek and Newman Inc. Adaptive computing system. 4,961,152, Cl. 364-513.000.

Davis, Wayne S.; Reynolds, Charles E.; and Whiteman, Robert N., Jr., to AMP Incorporated. Pin saver. 4,960,387, Cl. 439-374.000.

Davis, Wayne S.; Shirk, Michael E.; and Whiteman, Robert N., Jr., to AMP Incorporated. Strain relief. 4,960,390, Cl. 439-459.000.

Davy McKee, AG: *See—*
Thiele, Ulrich, 4,960,915, Cl. 524-706.000.

Davy McKee (London) Limited: *See—*
Harrison, George E.; and Hensman, John R., 4,960,960, Cl. 568-881.000.

Daycon Products, Inc.: *See—*
White, Jack D., Jr.; and Bishop, Clinton L., 4,960,476, Cl. 156-138.000.

Deb, Satyen K.: *See—*
Tsuo, Y. Simon; and Deb, Satyen K., 4,960,675, Cl. 430-311.000.

Debord, Pierre; and Glaise, Rene, to International Business Machines. Extended errors correcting device having single package error correcting and double package error detecting codes. 4,961,193, Cl. 371-37.200.

Debregeas, Patrice; Leduc, Gerard; and Boyer, Jean-Francois, to Ethypharm. Slow-release preparation of diltiazem, and a medicine provided thereby. 4,960,596, Cl. 424-458.000.

DeBruine, Gordon R.; Haataja, Bruce A.; and Sandberg, L. Bogue, to Michigan Technological University, Board of Control; and Weyerhaeuser Co. Method for forming articles having deep drawn portions from matted wood flakes. 4,960,553, Cl. 264-113.000.

De Caro, Charles J. Non-seating plate/fastener assembly. 4,959,938, Cl. 52-410.000.

Deeba, Michel: *See—*
Vedage, Gamini A.; Henderson, William W.; Toseland, Bernard A.; and Deeba, Michel, 4,960,941, Cl. 564-450.000.

De Fazio, Gabriele: *See—*
Canosi, Umberto; De Fazio, Gabriele; and Villa, Stefano, 4,960,868, Cl. 530-389.000.

Degen, Bruno; and Feldner, Kurt, to Bayer Aktiengesellschaft. Process for working up hydrolysis residues from the synthesis of organochlorosilanes. 4,960,523, Cl. 210-721.000.

de Givry, Jacques; Vallet, Jean C.; and Lalfer, Jean P., to MATRA. Mounting of electronic microcomponents on a support. 4,959,900, Cl. 29-840.000.

DeGrego, Ricardo S.: *See—*
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Gallagher, John P., deceased, 4,960,497, Cl. 204-153.160.
Delta Kogyo Co., Ltd.: *See*—
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Currie, Sara A.; Miller, Thomas W.; Dulaney, Eugene L.; Springer, James P.; Valiant, Mary E.; del Val, Sagrario M.; and Zimmerman, Sheldon B., 4,960,698, Cl. 435-119.000.
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Atsumi, Kiminori, 4,960,426, Cl. 623-16.000.
Dentini, Mark S.; Fulton, Joe A.; Jin, Sungho; Mottine, John J., Jr.; Shepherd, Lloyd; and Sherwood, Richard C., to AT&T Bell Laboratories. Thermal conductor assembly method. 4,960,612, Cl. 427-47.000.
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Honeycutt, Travis W., 4,960,594, Cl. 424-445.000.
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Opower, Hans, 4,961,201, Cl. 372-94.000.
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Jakobson, Gerald; and Siemanowski, Werner, 4,960,953, Cl. 568-621.000.
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Diamond, Harvey E. Vibration activated relief valve. 4,960,147, Cl. 137-45.000.
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Rising, Rolf C., 4,961,230, Cl. 381-69.200.
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Biytas, George C.; Diaz, Zaida; and Hart, William W. C., 4,960,865, Cl. 528-499.000.
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Kuhn, Rainer; Marhold, Albrecht; and Dicke, Hans-Rudolf, 4,960,539, Cl. 252-299.500.
Dickie, Robert G. Shielded connector assembly with noise suppressor. 4,960,392, Cl. 439-620.000.
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Kusakabe, Hideshi, 4,959,974, Cl. 62-228.500.
Dietz, Erwin; Hoffmann, Erich; and Weide, Joachim, to Hoechst Aktiengesellschaft. Bisphenol derivatives, process for their manufacture, and their use as surfactants. 4,960,935, Cl. 564-325.000.
Dieval, Gerard, to Thomson-Brandt Armements. Projectile comprising sub-projectiles with a pre-defined zone of effectiveness. 4,960,055, Cl. 102-489.000.
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Otto, Dennis L.; and Dimit, Richard O., 4,960,335, Cl. 384-484.000.
Dinges, Harold D. Construction form plug for nail. 4,959,886, Cl. 16-2.000.
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Dittmar, James A.: *See*—
Conlon, Brendan; Devine, James A.; and Dittmar, James A., 4,960,126, Cl. 128-633.000.
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Doan, Kim S.: *See*—
Nguyen, Thinn; Lazouni, Abdelkrim; and Doan, Kim S., 4,960,494, Cl. 204-67.000.
Doble, Florimel; Gallego, Jose M.; Steidl, El; and Jaffari, Cyrus, to Caspian International, Inc. Apparatus for depleted chemical milling solutions. 4,960,511, Cl. 210-96.100.
Dr. Ing. h.c.F. Porsche AG: *See*—
Binder, Harmut, 4,960,252, Cl. 248-56.000.
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Burnand, Richard P.; and Dodsworth, John, 4,959,929, Cl. 51-307.000.
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Doi, Katsumi. Jaw assembly. 4,960,285, Cl. 279-123.000.
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Olewska, Anna, 4,959,942, Cl. 52-745.000.
Donaghy, David J., to White Consolidated Industries, Inc. Support shelf for crisper drawers in refrigerators. 4,960,308, Cl. 312-214.000.
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Youn, Han S.; Dong, Kim, II; and Gyu, Choi I., 4,960,812, Cl. 524-291.000.
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Dore, Arthur M., Jr.; and Sutherland, Robert M., to Aerospace America, Inc. Containment apparatus. 4,960,143, Cl. 134-199.000.
Doryokuro Kakunenryo Kaihatsu Jigyodan: *See*—
Okuda, Takanari; Nomura, Shigeo; Shibahara, Itaru; Tateishi, Yoshinori; Hirano, Susumu; Teranishi, Hiroshi; Fujiwara, Masayuki; and Nishida, Toshio, 4,960,562, Cl. 376-416.000.
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Kumanoya, Masaki; Konishi, Yasuhiro; Dosaka, Katsumi; Komatsu, Takahiro; and Tobita, Youichi, 4,961,007, Cl. 307-296.200.
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Bedell, Stephen A.; and Kirby, Larry H., 4,960,575, Cl. 423-222.000.
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Dunmore, Gordon C., 4,960,893, Cl. 546-179.000.
Durvasula, Visweswara R., 4,960,950, Cl. 568-587.000.
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Lo, Grace Y.; Otterbacher, Eric W.; Bezoari, Massimo D.; and Walther, Brian W., 4,960,842, Cl. 526-175.000.
Stevens, James C.; and Fordyce, William A., 4,960,869, Cl. 534-11.000.
Doyle, Joseph S., to Eastern Shore Printing Corp. Film wrapped receptacle. 4,959,946, Cl. 53-415.000.
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Drapac, George; Woltz, Stephen H.; and Oliboni, Mark L., to Motorola, Inc. Battery saving apparatus and method providing optimum synchronization codeword detection. 4,961,073, Cl. 340-825.440.
Drappel, Stephan: *See*—
Wong, Raymond W.; Drappel, Stephan; and Croucher, Melvin D., 4,960,667, Cl. 430-114.000.
Drent, Eit, to Shell Oil Company. Polyketone polymer from carbon monoxide and bicyclo carboxylic acid compound. 4,960,857, Cl. 528-271.000.
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Martin, Paul W., 4,959,899, Cl. 29-726.000.

Drewitz, Hans: *See—*
Hagin, Faust; and Drewitz, Hans, 4,959,962, Cl. 60-626.000.
Dron, Donald I.: *See—*
Ashton, Michael J.; Bridge, Andrew W.; Dron, Donald I.; Fenton, Garry; Lythgoe, David J.; Newton, Christopher G.; Riddell, David; Smith, Christopher; and Stuttle, Keith A. J., 4,960,775, Cl. 514-248.000.
Drummer, Eugen: *See—*
Kronberger, Maximilian; and Drummer, Eugen, 4,960,241, Cl. 239-90.000.
Dube, Ghyslain; Huni, Jean-Paul; Lavoie, Serge; and Stevens, Wesley D., to Alcan International Limited. Recovery of non-ferrous metals from dross using plasma torch. 4,960,460, Cl. 75-10.190.
Dubin, Alan S.; Looney, Catharine E.; and Schmidt, Steven P., to Du Pont de Nemours, E. I., and Company. High resolution superimposed images from photopolymer electrographic master. 4,960,660, Cl. 430-49.000.
Dubois, Claude A. G.; and Lore, Xavier R. Y., to Societe Anonyme Dite Hispano-Suiza. Thrust reverser for a turbojet engine. 4,960,243, Cl. 239-265.290.
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Dumbaugh, George D., to Kinergy Corporation. Vibratory type storage bin arrangement with internal baffling and low profile bottom. 4,960,229, Cl. 222-161.000.
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Provence, Marc; Rousset, Didier; and Dunand, Josiane, 4,959,913, Cl. 36-117.000.
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Duncan, Robert J.: *See—*
Landman, Marc M.; Whitman, Steven M.; and Duncan, Robert J., 4,959,898, Cl. 29-705.000.
Dunlop Limited: *See—*
Shaw, Michael, 4,960,282, Cl. 273-232.000.
Dunmore, Gordon C., to Dow Chemical Company, The. 7-bromomethyl-5-halo-8-hydroxyquinoline and method of preparation. 4,960,893, Cl. 546-179.000.
Dunwoodie, Dave. Bridge for a stringed instrument. 4,960,027, Cl. 84-307.000.
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Cho, Thomas B., 4,960,687, Cl. 430-527.000.
Dubin, Alan S.; Looney, Catharine E.; and Schmidt, Steven P., 4,960,660, Cl. 430-49.000.
Gumprecht, William H., 4,960,580, Cl. 423-484.000.
Gumprecht, William H., 4,960,742, Cl. 502-24.000.
Hannon, John L., Jr., 4,960,263, Cl. 251-352.000.
Lahm, George P., 4,960,784, Cl. 514-403.000.
Nappa, Mario J.; Sievert, Allen C.; and Tong, Walter R., 4,960,951, Cl. 568-615.000.
Seibles, Josette C.; and Matrick, Howard, 4,960,677, Cl. 430-331.000.
Wilson, Denney L.; Rhine, Geoffrey A.; and Elmquist, Thomas L., 4,961,077, Cl. 346-1.100.
Wojtkowski, Paul W., 4,960,957, Cl. 568-747.000.
Duque Ros, Jordi J.: *See—*
Colom, Roberto C.; Duque Ros, Jordi J.; and Herrerq, Juan J. P., 4,960,429, Cl. 8-94.260.
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Duranel, Laurent; and Spitz, Roger, to Atochem. Catalyst system for the polymerization of propylene and process. 4,960,744, Cl. 502-127.000.
Durfey, Erik J.: *See—*
Moncrief, Rick L.; and Durfey, Erik J., 4,960,117, Cl. 273-148.00B.
Durr, Isabelle: *See—*
Loegel, Charles; Durr, Isabelle; Reichert, Sylvie; Loegel, Patrick; and Schneider, Francine, 4,960,176, Cl. 175-424.000.
Durst Phototechnik GmbH: *See—*
Gandini, Mario; and Obertegger, Franz, 4,961,087, Cl. 355-71.000.
Durvasula, Visweswara R., to Dow Chemical Company, The. Formation of nitrophenyl ethers from polyols and nitroanisoles. 4,960,950, Cl. 568-587.000.
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Holmwood, Graham; Jager, Gerhard; Buchel, Karl H.; Brandes, Wilhelm; Dutzmann, Stefan; and Hanssler, Gerd, 4,960,453, Cl. 71-92.000.
Holmwood, Graham; Kramer, Wolfgang; Regel, Erik; Elbe, Hans L.; Buchel, Karl H.; Dutzmann, Stefan; Brandes, Wilhelm; and Reinecke, Paul, 4,960,781, Cl. 514-383.000.
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Lorenz, Josef; and Kicherer, Robert, 4,960,978, Cl. 219-455.000.
E-Quad, Inc.: *See—*
Akerib, Richard, 4,960,098, Cl. 123-589.000.
Early, Jack; and Werth, John, to Engelhard Corporation. Fuel cell/battery control system. 4,961,151, Cl. 364-492.000.
Easley, Madlyn. Ready-made curtain system including swags and jabots. 4,960,161, Cl. 160-126.000.
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Doyle, Joseph S., 4,959,946, Cl. 53-415.000.
Eastman Kodak Company: *See—*
Bowne, Arlyce T., 4,960,685, Cl. 430-505.000.
Bryan, Philip S.; Lambert, Patrick M.; Towers, Christine M.; and Jarrold, Gregory S., 4,961,004, Cl. 250-483.100.
Cullinan, Ann M.; and Schwartz, Paul A., 4,960,682, Cl. 430-393.000.
Devon, Thomas J.; Phillips, Gerald W.; Puckette, Thomas A.; Stavinoha, Jerome L.; and Vanderbilt, Jeffrey J., 4,960,949, Cl. 568-454.000.
Hyche, Kenneth W.; and Gose, William C., 4,960,644, Cl. 428-407.000.
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Jessop, Thomas C., 4,961,115, Cl. 358-229.000.
Kaminski, Frank; and Schiffhauer, Earl J., 4,960,151, Cl. 137-376.000.
Owens, James C.; Baldwin, Roger E.; and Brophy, Chris P., 4,961,079, Cl. 346-108.000.
Pan, Kee-Chuan; Tyan, Yuan-Sheng; and Preuss, Donald R., 4,960,680, Cl. 430-346.000.
Wu, Stephen H. W.; Greene, Carol J.; and Sharma, Mahendra K., 4,960,814, Cl. 524-312.000.
Ebara Corporation: *See—*
Ishijima, Akira; Beppu, Toshihiko; and Kikuchi, Gunpei, 4,960,140, Cl. 134-31.000.
Ohshita, Takahiro; Higo, Tsutomu; and Mizoguchi, Yukio, 4,960,057, Cl. 110-345.000.
Eberle, Karl: *See—*
Gukkenberger, Horst; and Eberle, Karl, 4,960,498, Cl. 204-192.200.
EC Erdolchemie GmbH: *See—*
Schleppinghoff, Bernhard; Malessa, Reiner; Gabel, Christian; Scheef, Hans-Volker; and Lux, Mathias, 4,960,961, Cl. 568-899.000.
ECC America Inc.: *See—*
Rice, Camilla A., 4,960,816, Cl. 524-425.000.
ECC International Limited: *See—*
Smith, Douglas N.; and Goodman, Howard, 4,960,534, Cl. 252-145.000.
Eckardt, Klaus; Toepfer, Gottfried; Seifert, Andreas; Schulze, Manfred; Funke, Udo; Stepanauskas, Marlena, deceased; by Stepanauskas, Leonas-Vitas, legal representative; Stepanauskas, Daina, legal representative; Thrum, Heinz, deceased; by Thrum, Margot, legal representative; by Thrum, Mathias, legal representative; and by Thrum, Meichael, legal representative. Test combination and method of detecting fibrin monomers in blood. 4,960,694, Cl. 435-13.000.
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Shurben, William S., 4,960,565, Cl. 422-61.000.
Ecsery, Zoltan, deceased (by Jurkovich, Maria Escery nee, Zoltan Jossef Escery, heirs); Knoll, Jozsef; Somfai, Eva; Torok, Zoltan; Szinnyei, Eva; and Mozsolics, Karoly, to Chinoin Gyogyszer es Vegyeszeti Termekek Gyara Rt. N-2[(4-fluoro-phenyl)-1-methyl]-2-ethyl-N-methyl-N-propynyl amine and the method of use thereof. 4,960,797, Cl. 514-654.000.
Edlin, George R.: *See—*
Lavan, Michael J.; Edlin, George R.; and Whitener, Daniel L., 4,960,990, Cl. 250-251.000.
Eduard Kusters Maschinenfabrik GmbH & Co KG: *See—*
Anstotz, Helmut; and Brink, Egon, 4,960,046, Cl. 100-93.0RP.
Edwards, Arthur: *See—*
Gray, Randall C.; and Edwards, Arthur, 4,961,045, Cl. 323-273.000.
Egawa, Takatoshi: *See—*
Wada, Toshiya; Tanaka, Osamu; Egawa, Takatoshi; Yoshida, Makato; Higuchi, Seizun; and Izaki, Teruaki, 4,960,652, Cl. 428-611.000.
Egelhof, Dieter: *See—*
Weitzel, Wolfgang; and Egelhof, Dieter, 4,960,492, Cl. 162-301.000.
Eguchi, Ken: *See—*
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Ehrle, Sylvester L. Apparatus for dispensing pencils with erasure ferrules having a hopper with a coating on its surface that prevents the ferrules from contacting the hopper. 4,960,226, Cl. 221-202.000.
Eichenauer, Herbert; Leitz, Edgar; Ott, Karl-Heinz; and Pischtschan, Alfred, to Bayer Aktiengesellschaft. Thermoplastic moulding compounds with good processing properties and great toughness. 4,960,822, Cl. 525-67.000.
Eichler, Angelika: *See—*
Wagner, Eckhard; and Eichler, Angelika, 4,960,442, Cl. 51-295.000.
Eidinger, Helmut; and Scheurecker, Werner, to Voest-Alpine Industrieanlagenbau Gesellschaft mbH. Method and apparatus for adjusting a mold during casting in a continuous metal casting process. 4,960,165, Cl. 164-491.000.
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Yokoyama, Nobuyoshi; and Ejiri, Susumu, 4,960,078, Cl. 122-24.000.
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Sellergren, Borje; Ekberg, Bjorn A.; Albertsson, Per-Ake; and Mosbach, Klaus, 4,960,762, Cl. 514-57.000.
EKCO/GLACO, Inc.: *See—*
Tabler, Charles P.; and Stein, Eric D., 4,960,207, Cl. 206-507.000.
Elbe, Hans L.: *See—*
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Elder, Fred A.; Foley, Geoffrey M. T.; and Goffe, William L., to Xerox Corporation. Toner and developer compositions containing additives with certain morphologies. 4,960,665, Cl. 430-110.000.

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Hemmat, Naim S., 4,960,245, Cl. 239-597.000.

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Vigneron, Gilbert; Bezier, Jean; Nguyen-Thanh, Thong; Vidal, Pierre; Zacharie, Guy; and Guillemin, Lucien, 4,960,650, Cl. 428-594.000.

Electro-Tech, Inc.: *See—*
Quantz, Chester C., 4,960,033, Cl. 89-28.050.

Elettro Plastica S.r.l.: *See—*
Marelli, Luciano, 4,960,230, Cl. 222-321.000.

Eli Lilly and Company: *See—*
Ingolia, Thomas D.; Kaster, Kevin R.; and Rao, R. Nagaraja, 4,960,704, Cl. 435-252.330.

Elleman, Daniel D.: *See—*
Kendall, James M., Jr.; Wang, Taylor G.; and Elleman, Daniel D., 4,960,351, Cl. 425-6.000.

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Borror, Alan L.; and Ellis, Ernest W., 4,960,901, Cl. 548-207.000.

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Wilson, Denney L.; Rhine, Geoffrey A.; and Elmquist, Thomas L., 4,961,077, Cl. 346-1.100.

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Elron Electronic Industries Ltd.: *See—*
Orbach, Zvi; and Janai, Meir I., 4,960,729, Cl. 437-101.000.

Elsen, Joseph J.: *See—*
Kester, Jeffrey J.; Bernhardt, Christian A.; Elsen, Joseph J.; Letton, James A.; and Fox, Mary M., 4,960,600, Cl. 426-310.000.

Ema, Taiji, to Fujitsu Limited. Semiconductor memory device having a charge barrier layer for preventing soft error. 4,961,165, Cl. 365-182.000.

Emerson Electric Co.: *See—*
Terpstra, Daniel A., 4,960,026, Cl. 83-818.000.

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Landman, Marc M.; Whitman, Steven M.; and Duncan, Robert J., 4,959,898, Cl. 29-705.000.

EMI Limited: *See—*
Maufe, Barry G.; and Young, Nicholas A., 4,961,203, Cl. 375-1.000.

Emmons, William D.: *See—*
Bors, Daniel A.; and Emmons, William D., 4,960,924, Cl. 560-178.000.

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Lilie, Dietmar E. B., 4,960,368, Cl. 417-312.000.

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Satake, Yoshikatsu; Yamamoto, Shinji; Kaneko, Takashi; Tada, Masahito; Kashiwadate, Ken; Mizuno, Toshiya; Endo, Hiroyuki; Katto, Takayuki; and Shiiki, Zenya, 4,960,555, Cl. 264-288.400.
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Endo, Kenji, to NEC Corporation. Semiconductor laser. 4,961,196, Cl. 372-45.000.

Engel, Bernd: *See—*
Funk, Hans W.; Frank, Kurt; and Engel, Bernd, 4,961,026, Cl. 313-525.000.

Engelhard Corporation: *See—*
Early, Jack; and Werth, John, 4,961,151, Cl. 364-492.000.

Engelstoft, Mogens: *See—*
Biere, Helmut; Huth, Andreas; Rahtz, Dieter; Schmiechen, Ralph; Seidelmann, Dieter; Stephens, David; Engelstoft, Mogens; and Hansen, John B., 4,960,777, Cl. 514-253.000.

Enomoto, Katashi: *See—*
Itoh, Hisato; Oguchi, Takahisa; Enomoto, Katashi; Nakatsuka, Masakatsu; and Nishizawa, Tsutomu, 4,960,538, Cl. 252-299.200.

Entenmann, Gunther: *See—*
Bendix, Dieter; and Entenmann, Gunther, 4,960,866, Cl. 528-499.000.

Enterprise Sales & Company Inc.: *See—*
Evans, William B.; and Evans, Charles F., III, 4,960,966, Cl. 200-61.410.

Enya Mfg. Co., Ltd.: *See—*
Ichinose, Yusaku; and Imamura, Hitoshi, 4,960,485, Cl. 156-556.000.

Eonomoto, Takamitsu; Ueda, Hiroshi; Kawahara, Midori; Okada, Naoki; and Murata, Noboru, to Central Glass Company, Limited. Method of producing modified lead barium titanate ceramic useful as PTC thermistor. 4,960,551, Cl. 264-65.000.

Epner, Randolph L. Waste metal extraction apparatus. 4,960,500, Cl. 204-269.000.

Eppling, Gary L.: *See—*
Chandramouli, Bopsi; Eppling, Gary L.; and Tripp, Susan J., 4,961,186, Cl. 370-79.000.

Erdelen, Christian; Ringsdorf, Helmut; Prass, Werner; and Scheunemann, Ude, to Hoechst Aktiengesellschaft. Film consisting of one or more monomolecular layers. 4,960,635, Cl. 428-220.000.

Erdmann, Manfred: *See—*
Metz, Gunter; Rauchle, Kurt; and Erdmann, Manfred, 4,960,793, Cl. 514-532.000.

ERSA Ernst Sachs KG GmbH & Co.: *See—*
Weinbrecht, Michael, 4,960,975, Cl. 219-241.000.

Eschem Inc.: *See—*
Bodouroglou, John, 4,960,295, Cl. 281-15.100.

Esco Corporation: *See—*
Millager, Richard J., 4,960,162, Cl. 164-5.000.

Esna-Ashari, Mohammed; Kellerwessel, Hans; Gemmer, Ludwig; and Hamacher, Gert-Helge, to Klockner-Humboldt-Deutz AG. Method and installation for extracting gold from gold ore. 4,960,461, Cl. 423-27.000.

Esparza, Noemi: *See—*
Nelson, James E.; Castro, Valentine A.; and Esparza, Noemi, 4,960,121, Cl. 128-206.240.

Esseck, Christine. Invalid bed. 4,959,878, Cl. 5-424.000.

Ethyl Corporation: *See—*
Brackenridge, David R., 4,960,962, Cl. 570-200.000.
Smith, Kim R.; and Sauer, Joe D., 4,960,934, Cl. 564-298.000.

Ethyl Petroleum Additives, Inc.: *See—*
Everett, Armgard K.; and Perozzi, Edmund F., 4,960,528, Cl. 252-32.000.
Everett, Armgard K.; and Perozzi, Edmund F., 4,960,530, Cl. 252-32.70R.

Ethypharm: *See—*
Debregeas, Patrice; Leduc, Gerard; and Boyer, Jean-Francois, 4,960,596, Cl. 424-458.000.

Eustache, Jean-Pierre, to Valeo Systemes d'Essuyage. Windshield wiper deployment system using the wiper motor. 4,959,883, Cl. 15-250.350.

Evans, Charles F., III: *See—*
Evans, William B.; and Evans, Charles F., III, 4,960,966, Cl. 200-61.410.

Evans, Edwin R., to General Electric Company. Fluorosilicone compositions with improved elastic response. 4,960,811, Cl. 524-265.000.

Evans, Wayne E.; and Blytas, George C., to Shell Oil Company. Two-step heterocyclic nitrogen extraction from petroleum oils. 4,960,507, Cl. 208-254.00R.

Evans, Wayne E., to Shell Oil Company. Two-step heterocyclic nitrogen extraction from petroleum oils. 4,960,508, Cl. 208-254.00R.

Evans, William B.; and Evans, Charles F., III, to Enterprise Sales & Company Inc. Limit switch. 4,960,966, Cl. 200-61.410.

Everett, Armgard K.; and Perozzi, Edmund F., to Ethyl Petroleum Additives, Inc. Lubricating oil composition. 4,960,528, Cl. 252-32.000.

Everett, Armgard K.; and Perozzi, Edmund F., to Ethyl Petroleum Additives, Inc. Lubricating oil composition. 4,960,530, Cl. 252-32.70R.

Exxon Production Research Company: *See—*
Young, Dewey R., II, 4,960,183, Cl. 181-107.000.

Exxon Research and Engineering Company: *See—*
Bhagat, Phiroz M.; Koros, Robert M.; Patel, Rutton D.; Peruyero, Jose M.; and Wyatt, John T., 4,960,571, Cl. 422-194.000.
Halbert, Thomas R.; Stiefel, Edward I.; Chianelli, Russell R.; and Ho, Teh C., 4,960,506, Cl. 208-215.000.
Hazelton, Donald R.; Puydak, Robert C.; and Booth, D. A., 4,960,830, Cl. 525-196.000.
Iglesia, Enrique; Soled, Stuart L.; and Fiato, Rocco A., 4,960,801, Cl. 518-715.000.
Peiffer, Dennis G., 4,960,821, Cl. 524-534.000.
Vaughan, David E. W.; and Strohmaier, Karl G., 4,960,578, Cl. 423-326.000.

F.A.D.I. Fabrica Aspirapolvere Domestic Industriali: *See—*
Rizzitiello, Gilberto, 4,960,149, Cl. 137-205.000.

F.M.R. Devices, Inc.: *See—*
Fernandez, Robert; and Sanchelima, Jesus, 4,961,215, Cl. 379-56.000.

Fabricated Metals, Inc.: *See—*
Coleman, Clarence B., 4,960,227, Cl. 222-94.000.

Failli, Amedeo A., to American Home Products Corporation. Trifluoromethoxy substituted 1,3,4,9-tetrahydropyrano-(3,4-b)indole-1-acetic acids. 4,960,902, Cl. 548-432.000.

Falch, Erik: *See—*
Krogsgaard-Larsen, Povl; Falch, Erik; and Pedersen, Henrik, 4,960,769, Cl. 514-215.000.

Fang, Que-Tsang; and Kinosz, Michael J., to Aluminum Company of America. Fine grain casting by mechanical stirring. 4,960,163, Cl. 164-459.000.

Fanuc Ltd.: *See—*
Seki, Masaki; Samukawa, Koji; and Meguro, Hidenori, 4,961,041, Cl. 318-578.000.
Seki, Masaki; Samukawa, Koji; and Hanaoka, Osamu, 4,961,150, Cl. 364-474.290.

Farbood, Mohamad I.; Morris, James A.; Sprecker, Mark A.; Bienkowski, Lynda J.; Miller, Kevin P.; Vock, Manfred H.; and Hagedorn, Myrna L., to International Flavors & Fragrances Inc. Flavoring with mixtures of lactones. 4,960,597, Cl. 426-3.000.

Farbood, Mohamad I.: *See—*
Buckholz, Lawrence L., Jr.; Farbood, Mohamad I.; Kossiakoff, Nicolas; Scharpf, Lewis G.; and Seitz, Eugene W., 4,960,603, Cl. 426-536.000.

Farmaceutisk Laboratorium Ferring A/S: *See*—
Halskov, Soren, 4,960,765, Cl. 514-166.000.
Farmer, Daniel: *See*—
Singer, Richard; and Farmer, Daniel, 4,960,384, Cl. 439-155.000.
Farmos-Yhtyma Oy: *See*—
Eloranta, Maire M., 4,960,939, Cl. 564-374.000.
Farnaam, Mohammad: *See*—
Dixit, Pankaj; Sliwa, Jack; Klein, Richard K.; Sander, Craig S.; and Farnaam, Mohammad, 4,960,732, Cl. 437-192.000.
Farr, William: *See*—
Stocker, Harold L.; and Farr, William, 4,960,258, Cl. 248-467.000.
Farrand, Philip F., to Wenger Corporation. Method and apparatus for representing musical information. 4,960,031, Cl. 84-609.000.
Fatehi, Feyzi: *See*—
Hong, Le Thieu; Givens, Cynthia; Liu, Ching Chao; Wright, Michael J.; and Fatehi, Feyzi, 4,961,139, Cl. 364-200.000.
Fatemi, Mohammad, to United States of America, Navy. High resolution technique and instrument for measuring lattice parameters in single crystals. 4,961,210, Cl. 378-73.000.
Faulkner, W. Harrison, III: *See*—
Slautterback, Fred A.; Faulkner, W. Harrison, III; and Lesko, Bradley P., 4,960,619, Cl. 427-265.000.
Faye, Bradley D.; Hilby, James A.; Alff, Denis; and Hajzler, Christian, to Torrington Company, The. Antifriction bearing assembly speed sensor. 4,960,333, Cl. 384-448.000.
Feldborg, Richard E.: *See*—
Dassance, Donald A.; and Feldborg, Richard E., 4,959,988, Cl. 72-421.000.
Feldner, Kurt: *See*—
Degen, Bruno; and Feldner, Kurt, 4,960,523, Cl. 210-721.000.
Felice, John S.: *See*—
Holda, Steven F.; Plonka, Francis E.; VandenBrossche, Daniel J.; and Felice, John S., 4,961,148, Cl. 364-468.000.
Fenton, Garry: *See*—
Ashton, Michael J.; Bridge, Andrew W.; Dron, Donald I.; Fenton, Garry; Lythgoe, David J.; Newton, Christopher G.; Riddell, David; Smith, Christopher; and Stuttle, Keith A. J., 4,960,775, Cl. 514-248.000.
Fergusson, Gordon J.: *See*—
Vestal, Marvia L.; Blakely, Calvin R.; and Fergusson, Gordon J., 4,960,992, Cl. 250-288.000.
Fernandez, Robert; and Sanchelima, Jesus, to F.M.R. Devices, Inc. Continuous radio announcer. 4,961,215, Cl. 379-56.000.
Feser, Rainer: *See*—
Mueller, Michael W.; Hoppe, Kalus-Dieter; Schwab, Ekkehard; Steck, Werner; Auweter, Helmut; and Feser, Rainer, 4,960,462, Cl. 75-252.000.
Fetcenko, Raymond M.: *See*—
Stumphauzer, William C.; and Fetcenko, Raymond M., 4,960,628, Cl. 428-81.000.
Feuer, Mark S.; and Smith, Eugene P., III, to Fittraxx, Inc. Cross country ski exercise apparatus. 4,960,276, Cl. 272-97.000.
Fiato, Rocco A.: *See*—
Iglesia, Enrique; Soled, Stuart L.; and Fiato, Rocco A., 4,960,801, Cl. 518-715.000.
Fichtel & Sachs AG: *See*—
Wossner, Felix, 4,960,188, Cl. 188-299.000.
Fields, Grethel C., III, to Recontainer, Inc. Secondary liquid containment system. 4,960,222, Cl. 220-5.00A.
Fife, James A.; and Hard, Robert A., to Cabot Corporation. Controlling the oxygen content in tantalum material. 4,960,471, Cl. 148-20.300.
Figgie International, Inc.: *See*—
Nelson, James E.; Castro, Valentine A.; and Esparza, Noemi, 4,960,121, Cl. 128-206.240.
Figueroa, Ramon, Jr.; Harrison, Bobby G., Jr.; and SaNogueira, James P., to Richardson-Vicks Inc. Oil-in-water-in-silicone emulsion compositions. 4,960,764, Cl. 514-63.000.
Filipow, Catherine M.; and Whited, Arthur R. Security device for a front-loading VCR. 4,959,979, Cl. 70-58.000.
Filmtec Corporation: *See*—
Cadotte, John E., 4,960,517, Cl. 210-639.000.
Cadotte, John E.; and Racchini, Joel R., 4,960,518, Cl. 210-639.000.
Fink, E. David, to Universal Medical Instrument Corp. Catheter introducing system. 4,960,412, Cl. 604-167.000.
Finkenzeller, Johann; and Hubert, Guenter, to Siemens Aktiengesellschaft. Cassette for an x-ray luminescent storage screen. 4,961,000, Cl. 250-484.100.
Fisher, Daniel: *See*—
Carney, Donald R.; and Fisher, Daniel, 4,960,021, Cl. 83-120.000.
Fisher Scientific Company: *See*—
Lentrichia, Brian B.; and Turanchik, Michael F., 4,960,692, Cl. 435-7.000.
Fitch, Clifford E. Apparatus for slicing meat sticks. 4,960,025, Cl. 83-703.000.
Fittraxx, Inc.: *See*—
Feuer, Mark S.; and Smith, Eugene P., III, 4,960,276, Cl. 272-97.000.
Fitzpatrick, John P. Quick change vise jaw. 4,960,270, Cl. 269-282.000.
Flamm, Daniel L.: *See*—
Chang, Chorng-Ping; Flamm, Daniel L.; Ibbotson, Dale E.; and Mucha, John A., 4,960,656, Cl. 428-704.000.
Fleissner, Gerold, to Fleissner Machinenfabrik AG. Fiber baling press. 4,959,948, Cl. 53-528.000.
Fleissner Machinenfabrik AG: *See*—
Fleissner, Gerold, 4,959,948, Cl. 53-528.000.
Flynn, William M.: *See*—
Machado, Octavio; Henry, Clifford W.; Congleton, Ray L.; and Flynn, William M., 4,960,560, Cl. 376-272.000.
FMC Corporation: *See*—
Hoare, John H., 4,960,922, Cl. 560-124.000.
Roush, David M.; Shaw, Donald A.; Jones, Michael L.; and Chang, Jun H., 4,960,884, Cl. 514-721.000.
Fos, Uriel G. Container assemblies capable of receiving and maintaining plural types of waste materials separated for separate disposal of each type of waste material. 4,960,220, Cl. 220-23.830.
Focke & Co. (GmbH & Co.): *See*—
Focke, Heinz, 4,960,234, Cl. 226-15.000.
Focke, Heinz, to Focke & Co. (GmbH & Co.). Apparatus for separating webs of material into (two) part webs. 4,960,234, Cl. 226-15.000.
Fogg, James L., to Westinghouse Electric Corp. Capture row storage tray for holding collated rows of nuclear fuel pellets. 4,960,559, Cl. 376-261.000.
Fohrman, Scott R. Grinder closure for a container. 4,960,246, Cl. 241-169.100.
Foldi, Tivadar; Bernat, Istvan; and Vogronics, Laszlo, to Vertikum Magas-es Melyepitmenyjavito Kisszovetkezet. Apparatus for geometrical testing of spherical bodies, in particular steel balls. 4,960,332, Cl. 356-376.000.
Foley, Geoffrey M. T.: *See*—
Elder, Fred A.; Foley, Geoffrey M. T.; and Goffe, William L., 4,960,665, Cl. 430-110.000.
Fong, Bright K. C. Multi-jaw vise. 4,960,269, Cl. 269-87.200.
Fong, Steven: *See*—
Mattox, Robert; and Fong, Steven, 4,960,727, Cl. 437-67.000.
Ford Aerospace Corporation: *See*—
Wright, Joseph M., 4,960,550, Cl. 264-56.000.
Ford Motor Company: *See*—
Brown, Franklin I., 4,960,324, Cl. 350-357.000.
Demiryont, Hulya, 4,960,323, Cl. 350-357.000.
Fordyce, William A.: *See*—
Stevens, James C.; and Fordyce, William A., 4,960,869, Cl. 534-11.000.
Formaini, Richard, to Georgia-Pacific Corporation. Urea-formaldehyde compositions and method of manufacture. 4,960,856, Cl. 528-256.000.
Fortune, David J.; and Wright, David E., to 501 British Autogard Limited. Fluid pressure clutch. 4,960,190, Cl. 192-56.00F.
Foster, George N.; Petty, Herbert E.; and Blevins, Charles H., II., to Union Carbide Chemicals and Plastics Company Inc. Polymer compositions stabilized with polydialkylsiloxanes containing siloxy units having certain defined pendant sterically hindered phenol moieties. 4,960,810, Cl. 524-265.000.
Foster Wheeler U.S.A.: *See*—
DiGiacomo, Frank A.; Malsbury, Alan J.; and Myszka, Ronald T., 4,960,358, Cl. 414-684.300.
Fouche, Alain; and Malbe, Serge, to Thomson Composants Microondes. Method for welding two metallic parts by laser beam and electronic package welded thereby. 4,960,973, Cl. 219-121.640.
Fournier Innovation et Synergie: *See*—
Samreth, Soth; Bellamy, Francois; and Millet, Jean, 4,960,758, Cl. 514-24.000.
Fovell, Richard C.; Heinemann, Jan M.; and Heinemann, Klaus W., to Alten Corporation. Corona discharge ozonator with cooled flow path. 4,960,569, Cl. 422-186.190.
Fox, Mary M.: *See*—
Kester, Jeffrey J.; Bernhardt, Christian A.; Elsen, Joseph J.; Letton, James A.; and Fox, Mary M., 4,960,600, Cl. 426-310.000.
Fraisse, Jacques: *See*—
Signoret, Jacques; Fraisse, Jacques; Baroux, Bruno; and Carla, Francis, 4,960,249, Cl. 244-118.500.
Framatome: *See*—
Gerard, Chevereau; and Babin, Michel, 4,960,561, Cl. 376-352.000.
Frank, Kurt: *See*—
Funk, Hans W.; Frank, Kurt; and Engel, Bernd, 4,961,026, Cl. 313-525.000.
Frank, Richard, to Siemens Aktiengesellschaft. X-ray image intensifier with conductive-coat electrodes on insulated metal sidewalls. 4,960,987, Cl. 250-213.0VT.
Frantz, Robert H.; Mosser, Benjamin H., III; Myers, Earl C., Jr.; and Reynolds, Charles E., to AMP Incorporated. Circular cross section DIN connector and DIN connector assembly. 4,960,388, Cl. 439-404.000.
Frantz, Robert H.; Mosser, Benjamin H., III; Myers, Earl C., Jr.; and Reynolds, Charles E., to AMP Incorporated. Circular DIN electrical connector. 4,960,389, Cl. 439-404.000.
Frantz, Ronald F., to International Healthcare Products, Inc. Contour retaining back support cushion. 4,960,304, Cl. 297-284.000.
Fratelli Lamberti S.p.A.: *See*—
Molteni, Giuseppe; Nicora, Carlo; Cesaro, Attilio; and Pricl, Sabrina, 4,960,876, Cl. 536-114.000.
Fredrickson, Robert W.; and Goris, Andrew C., to Hewlett Packard Company. Graphics frame buffer with strip Z buffering and programmable Z buffer location. 4,961,153, Cl. 364-521.000.
Freimann, Paul; and Staudinger, Gernot, to Voest-Alpine Aktiengesellschaft. Arrangement for gasifying fuels. 4,960,439, Cl. 48-62.00R.
Freisinger, Henry: *See*—
Stritzl, Karl; Hoffmann, Kurt; Freisinger, Henry; Janisch, Andreas; Brunnhuber, Egon; Zotter, Johann; Spitaler, Egelbert; Wladar, Helmut; Muhlberger, Reinhard; and Dapeci, Karl, 4,960,289, Cl. 280-630.000.

Freitag, Dieter: *See*—
Kloker, Werner; Freitag, Dieter; Uerdingen, Walter; Hess, Bernhard; and Schmid, Helmut, 4,961,179, Cl. 369-288.000.

Friedman, Emil M.: *See*—
Sandstrom, Paul H.; and Friedman, Emil M., 4,960,819, Cl. 524-516.000.

Friedmann, Hans: *See*—
Astheimer, Hans; Friedmann, Hans; and Schuy, Hubert, 4,961,121, Cl. 360-103.000.

Friel, Thomas C., Jr.; and O'lenick, Anthony J., Jr. Alkoxylated bisamide defoaming compounds. 4,960,540, Cl. 252-358.000.

Frimont S.p.A.: *See*—
Lanzani, Emanuele, 4,959,967, Cl. 62-138.000.

Frohberger, Paul-Ernst: *See*—
Holmwood, Graham; Regel, Erik; Jager, Gerhard; Buchel, Karl H.; Larssen, Klaus; Frohberger, Paul-Ernst; Brandes, Wilhelm; and Paul, Volker, 4,960,456, Cl. 71-92.000.

Frontec Produkter Aktiebolag: *See*—
Nyman, Sigurd, 4,960,251, Cl. 246-169.00A.

Fry, Steven A.; and Stafford, Rodney L. Disposable liner for pickup truck beds. 4,960,301, Cl. 296-39.200.

Frystak, Richard; O'Callaghan, John S., Sr.; and Colson, Jean-Jacques, to Bell & Howell Company. Dual mode documeat feeder. 4,960,273, Cl. 271-10.000.

Fudim, Efrem V.; and Colla, Jeannine O., to Johnston Service Company. Method of fabricating fluidic plates and devices by irradiation of photopolymers. 4,960,674, Cl. 430-284.000.

Fuhge, Peter: *See*—
Kumpe, Gerhardt; Wormsbacher, Wilfried; Heimburger, Norbert; Fuhge, Peter; and Preis, Hans M., 4,960,757, Cl. 514-21.000.

Fuji Electric Co., Ltd.: *See*—
Aoki, Toyoaki; Kawakami, Kouji; Tanaka, Yoshiharu; and Hoshikawa, Hiroshi, 4,960,711, Cl. 436-124.000.

Fuji Electric Corporate Research & Development: *See*—
Sato, Noritada, 4,960,436, Cl. 437-3.000.

Fuji Jukogyo Kabushiki Kaisha: *See*—
Kashiwase, Hajime, 4,960,005, Cl. 74-329.000.
Tachibana, Fusao; Ishikawa, Hideyuki; and Suzuki, Kazuo, 4,960,097, Cl. 123-494.000.

Fuji Koki Manufacturing Co., Ltd.: *See*—
Tanaka, Hazime; and Schumacher, Ernest W., 4,959,973, Cl. 62-225.000.

Fuji Photo Film Co., Ltd.: *See*—
Akao, Mutsuo; Watanabe, Seiichi; and Komatsu, Takuichi, 4,960,626, Cl. 428-36.920.
Aotsuka, Yasuo, 4,960,681, Cl. 430-351.000.
Cho, Michio; Aosaki, Ko; and Sato, Tokuji, 4,961,085, Cl. 354-295.000.
Ishikawa, Takatoshi; Fujimoto, Hiroshi; Yagihara, Morio; and Andoh, Kazuto, 4,960,684, Cl. 430-467.000.
Iwamoto, Shoji, 4,960,480, Cl. 156-256.000.
Kato, Eiichi; and Ishii, Kazuo, 4,960,661, Cl. 430-49.000.
Komatsuzaki, Hiroshi; Kamata, Kazuo; Ohmiya, Akio; Nishimura, Syunji; Umeda, Yoshihito; Mochizuki, Noriya; and Furuya, Eiji, 4,961,084, Cl. 354-268.000.
Matsuda, Shinichi; Saito, Yoshio; and Ishizaka, Hideo, 4,959,976, Cl. 62-271.000.
Nakamura, Koutaro; and Kawashima, Yoshiro, 4,960,670, Cl. 430-138.000.
Nishikawa, Toshihiro; Takada, Shunji; and Hasebe, Kazunori, 4,960,689, Cl. 430-603.000.
Ogawa, Masazumi; Watanabe, Kenichi; and Yamazaki, Tsutomu, 4,959,897, Cl. 29-227.000.
Ohkawa, Atsuhiro, 4,960,895, Cl. 546-257.000.
Okada, Hisashi; and Katoh, Kazunobu, 4,960,672, Cl. 430-264.000.
Okazaki, Masaki; Ikegawa, Akihiko; Yamada, Minoeu; and Steo, Kunio, 4,960,683, Cl. 430-428.000.
Sakanoue, Kei; Ishii, Yoshio; and Hirano, Tsumoru, 4,960,688, Cl. 430-548.000.
Shigyo, Masao; and Asai, Eiichi, 4,960,993, Cl. 250-327.200.
Takenaka, Yuji, 4,961,086, Cl. 355-41.000.
Tsubata, Yukihiro; and Shiino, Masaru, 4,960,350, Cl. 406-84.000.

Fuji Xerox Co., Ltd.: *See*—
Mukai, Toshio; Yamashita, Yoshiro; and Suzuki, Takanori, 4,960,886, Cl. 544-35.000.
Nishikawa, Masayuki; Komori, Yumiko; Yokoi, Masaki; Ono, Masato; Takahashi, Noriyoshi; Fukuda, Yuzuru; Yagi, Shigeru; and Karakida, Ken-ichi, 4,960,662, Cl. 430-64.000.
Yeh, Ching Fa; and Yatsuda, Yuji, 4,961,101, Cl. 357-49.000.

Fujikura Ltd.: *See*—
Hanaoka, Kazuo; Chabata, Sueji; Koike, Michio; and Tsuboi, Takao, 4,960,641, Cl. 428-383.000.

Fujimori, Junichi, to Yamaha Corporation. Automatic musical performance apparatus having reduced wait time. 4,960,030, Cl. 84-609.000.

Fujimoto, Hiroshi: *See*—
Ishikawa, Takatoshi; Fujimoto, Hiroshi; Yagihara, Morio; and Andoh, Kazuto, 4,960,684, Cl. 430-467.000.

Fujinawa, Yukio: *See*—
Takahashi, Kozo; and Fujinawa, Yukio, 4,961,143, Cl. 364-421.000.

Fujioka, Hironari: *See*—
Mukoyoshi, Shunichiro; Yamori, Tsunefumi; Shuku, Shigekazu; and Fujioka, Hironari, 4,960,638, Cl. 428-342.000.

Fujisawa, Atsuhisa; Ojima, Masuo; Wakabayashi, Kenji; Omoto, Souji; and Shimizu, Toyokazu, to Kansai Paint Company, Limited. Method of remedying coating. 4,960,611, Cl. 427-43.100.

Fujisawa, Nobuhiko: *See*—
Mimura, Takashi; and Fujisawa, Nobuhiko, 4,960,049, Cl. 101-217.000.

Fujisawa Pharmaceutical Co., Ltd.: *See*—
Takaya, Takao; Sakane, Kazuo; Miyai, Kenzi; and Kawabata, Kohji, 4,960,766, Cl. 514-202.000.
Takaya, Takao; Takasugi, Hisashi; Masugi, Takashi; Yamanaka, Hideaki; and Kawabata, Kohji, 4,960,889, Cl. 544-329.000.

Fujitsu Limited; Maki, Yasuhiko; and Nomura, Osamu, to Fujitsu Limited; and Fujitsu Vlsi Limited. Logic circuit using bipolar complementary metal oxide semiconductor gate and semiconductor memory device having the logic circuit. 4,961,170, Cl. 365-190.000.

Fujitsu Limited: *See*—
Ema, Taiji, 4,961,165, Cl. 365-182.000.
Ibukuro, Sadao, 4,961,057, Cl. 330-295.000.
Kuroda, Shigeru; Mimura, Takashi; and Notomi, Seishi, 4,961,194, Cl. 357-22.000.

Fujitsu Vlsi Limited: *See*—
Fujitsu Limited; Maki, Yasuhiko; and Nomura, Osamu, 4,961,170, Cl. 365-190.000.

Fujiwara, Masayuki: *See*—
Okuda, Takanari; Nomura, Shigeo; Shibahara, Itaru; Tateishi, Yoshinori; Hirano, Susumu; Teranishi, Hiroshi; Fujiwara, Masayuki; and Nishida, Toshio, 4,960,562, Cl. 376-416.000.

Fujiwara, Toshiaki; and Katoh, Chieji. Power reduction during power down. 4,961,008, Cl. 307-296.300.

Fujiyama, Eiji: *See*—
Suzuki, Yasuhiro; Mori, Sumio; Fujiyama, Eiji; and Sasaki, Masami, 4,960,073, Cl. 118-723.000.

Fukasawa, Atsushi: *See*—
Sato, Shinichi; Fukasawa, Atsushi; Sato, Takuro; Shoji, Yasuo; Shiino, Haruhiro; Suzuki, Yukio; and Ando, Hiromi, 4,961,160, Cl. 364-724.010.

Fukuda, Kazumi: *See*—
Kanchara, Koichi; and Fukuda, Kazumi, 4,960,196, Cl. 194-215.000.

Fukuda, Toshiyuki, to Sanden Corporation. Method for controlling the defrosting of refrigerator-freezer units of varying degrees of frost accumulation. 4,959,968, Cl. 62-155.000.

Fukuda, Yuzuru: *See*—
Nishikawa, Masayuki; Komori, Yumiko; Yokoi, Masaki; Ono, Masato; Takahashi, Noriyoshi; Fukuda, Yuzuru; Yagi, Shigeru; and Karakida, Ken-ichi, 4,960,662, Cl. 430-64.000.

Fukuoka, Mitsuhiro: *See*—
Tamiya, Fumiyuki; Kobayashi, Nobuaki; and Fukuoka, Mitsuhiro, 4,960,340, Cl. 401-186.000.

Fuller, Timothy J.: *See*—
Weagley, Ronald J.; Fuller, Timothy J.; and Levy, Michael J., 4,960,666, Cl. 430-109.000.

Fulton, Joe A.: *See*—
Dentini, Mark S.; Fulton, Joe A.; Jin, Sungho; Mottine, John J., Jr.; Shepherd, Lloyd; and Sherwood, Richard C., 4,960,612, Cl. 427-47.000.

Funk, Hans W.; Frank, Kurt; and Engel, Bernd, to Proxitronic Funk GmbH & Co. KG. Proximity focused image intensifier having a glass spacer ring between a photocathode and a fluorescent screen disk. 4,961,026, Cl. 313-525.000.

Funke, Udo: *See*—
Eckardt, Klaus; Toepfer, Gottfried; Seifert, Andreas; Schulze, Manfred; Funke, Udo; Stepanauskas, Marlena, deceased; Stepanauskas, Leonas-Vitas, legal representative; Stepanauskas, Daina, legal representative; Thrum, Heinz, deceased; Thrum, Margot, legal representative; Thrum, Mathias, legal representative; and Thrum, Meichael, legal representative, 4,960,694, Cl. 435-13.000.

Furuhashi, Hiroyuki: *See*—
Murata, Masahide; Imai, Masafumi; Furuhashi, Hiroyuki; Maruyama, Kouji; and Ueno, Hiroshi, 4,960,743, Cl. 502-121.000.

Furukawa Electric Co., Ltd., The: *See*—
Kosuga, Izumi; Otani, Kenichi; and Matsumuto, Kazuaki, 4,960,642, Cl. 428-407.000.

Furuya, Eiji: *See*—
Komatsuzaki, Hiroshi; Kamata, Kazuo; Ohmiya, Akio; Nishimura, Syunji; Umeda, Yoshihito; Mochizuki, Noriya; and Furuya, Eiji, 4,961,084, Cl. 354-268.000.

Fuse, Tadashi: *See*—
Masuda, Yoshitomo; Ogawa, Masao; Arai, Katsuhiko; Suzuki, Kinya; Fuse, Tadashi; and Amano, Tetsuro, 4,960,657, Cl. 429-194.000.

Fushimi, Kimio: *See*—
Okamoto, Hiroshi; Fushimi, Kimio; Mochizuki, Satoru; and Ootuka, Yoshio, 4,959,969, Cl. 62-157.000.

Futura Coatings, Inc.: *See*—
Jarboe, Enos D.; Jarboe, Rodney D.; and Barclay, Edward M., 4,960,622, Cl. 428-15.000.

G. S. Blodgett Co., Inc.: *See*—
Alden, Lorne B., 4,960,977, Cl. 219-388.000.

G. T. Products, Inc.: *See*—
Bergsma, Rudolph, 4,960,153, Cl. 137-587.000.

Gabel, Christian: *See*—
Schleppinghoff, Bernhard; Malessa, Reiner; Gabel, Christian; Scheef, Hans-Volker; and Lux, Mathias, 4,960,961, Cl. 568-899.000.

Gabrielson, James E.: *See*—
Berkau, Eugene; Breen, Bernard; Gabrielson, James E.; and Winberg, Steve, 4,960,059, Cl. 110-347.000.

Gadras, Alain: *See*—
Borrod, Guy; and Gadras, Alain, 4,960,454, Cl. 71-92.000.

Gallagher, Janice M., legal representative: *See*—
Gallagher, John P., deceased, 4,960,497, Cl. 204-153.160.

Gallagher, John P., deceased (Gallagher, Janice M., legal representative), to Delta F Corporation. Apparatus and method for minimizing the effect of an electrolyte's dissolved oxygen content in low range oxygen analyzers. 4,960,497, Cl. 204-153.160.

Gallego, Jose M.: *See*—
Doble, Florimel; Gallego, Jose M.; Steidl, El; and Jaffari, Cyrus, 4,960,511, Cl. 210-96.100.

Gandini, Mario; and Obertegger, Franz, to Durst Phototechnik GmbH. Diaphragm adjusting arrangement in a photographic enlarging or copying apparatus having several lenses with an adjustable diaphragm. 4,961,087, Cl. 355-71.000.

Gantz, Josef; and Tenenboim, Menahem. Sun operated boiler for heating liquids. 4,960,105, Cl. 126-437.000.

Garcia, Maria; and Gimenez-Gallego, Guillermo, to Merck & Co., Inc. Leiurus quinquestriatus venom peptide inhibitor of calcium activated potassium channels. 4,960,867, Cl. 530-324.000.

Gas Research Insitute: *See*—
Nunes, Maurice; Grimanis, Michael P.; Hurley, James R.; and Shukla, Kailash C., 4,960,377, Cl. 431-12.000.

Gebruder Linck Maschinenfabrik "Gatterlinck" GmbH & Co. KG: *See*—
Reuter, Alfred; and Klumpp, Gunter, 4,960,023, Cl. 83-368.000.

Geisenberger, Josef: *See*—
Papenfuhs, Theodor; and Geisenberger, Josef, 4,960,940, Cl. 564-440.000.

Geist, Henry E.; and Segerson, Eugene E., to Motorola Inc. Electrically isolated heatsink for single-in-line package. 4,961,107, Cl. 357-81.000.

Geisthoff, Hubert; and Kampf, Klaus, to Jean Walterscheid GmbH. Locking mechanism for fixing an outer part on an inner part. 4,960,344, Cl. 403-316.000.

Gellner, Harald: *See*—
Mauz, Lothar; and Gellner, Harald, 4,959,982, Cl. 70-248.000.

Gemmer, Ludwig: *See*—
Esna-Ashari, Mohammed; Kellerwessel, Hans; Gemmer, Ludwig; and Hamacher, Gert-Helge, 4,960,461, Cl. 423-27.000.

Genentech, Inc.: *See*—
Malfroy-Camine, Bernard; and Schofield, Peter R., 4,960,700, Cl. 435-172.300.

General Binding Corporation: *See*—
King, Michael T.; and Petges, Neal E., 4,960,484, Cl. 156-499.000.

General DataComm, Inc.: *See*—
Gorniak, Andrew M., 4,961,138, Cl. 364-200.000.

General Electric Company: *See*—
Baliga, Bantval J.; Chang, Hsueh-Rong; and Howell, Edward K., 4,961,100, Cl. 357-39.000.
Cole, Herbert S.; and Liu, Yung S., 4,960,613, Cl. 427-53.100.
DeRudder, James L., 4,960,836, Cl. 525-423.000.
Evans, Edwin R., 4,960,811, Cl. 524-265.000.
MacMinn, Stephen R., 4,961,038, Cl. 318-696.000.
Moore, James H., 4,960,006, Cl. 74-384.000.
Olson, Daniel R.; and O'Neil, Elbridge A., Jr., 4,960,824, Cl. 524-600.000.
Park, John N.; Mueller, Otward M.; and Roemer, Peter B., 4,961,054, Cl. 324-322.000.
Rosenquist, Niles R., 4,960,839, Cl. 525-462.000.
Rosenquist, Niles R., 4,960,863, Cl. 528-480.000.
Scheldorf, Gary O.; Gordon, James F.; and Scheldorf, Owen H., 4,960,372, Cl. 418-63.000.
Schneiter, John L., 4,960,970, Cl. 219-121.600.
Strok, Jack M., 4,961,020, Cl. 313-025.000.
van der Meer, Roelof, 4,960,825, Cl. 525-92.000.

General Motors Corporation: *See*—
Lambert, Harvey J.; and Kennedy, Lawrence C., 4,960,191, Cl. 192-58.00B.
Peng, Yuchi P.; Hallmann, Melvin H.; and Ward, Robert W., 4,961,016, Cl. 310-62.000.
Short, William T., 4,960,558, Cl. 264-510.000.

Gentles, Robert, to Marconi Company Limited, The. Piezo-electric transducer test apparatus. 4,959,992, Cl. 73-10.00V.

Genvention, Inc.: *See*—
Towsend, Marvin S., 4,960,018, Cl. 83-13.000.

Georges, Eric: *See*—
Verdier, Claude; Leporcq, Bruno; Georges, Eric; and Barraud, Roger, 4,961,200, Cl. 372-89.000.

Georgia Duck and Cordage Mill: *See*—
Willibey, Gary L.; Hawkins, John W.; Harp, Russell P.; and Wilkinson, David M., 4,960,349, Cl. 405-262.000.

Georgia-Pacific Corporation: *See*—
Formaini, Richard, 4,960,856, Cl. 528-256.000.

Gerard, Barcelo; Senet, Jean-Pierre; and Sennyey, Gerard, to Societe Nationale des Poudres et Explosifs. α-chlorinated carbonates, their method of manufacture and application in the protection of the amine functions of amino acids. 4,960,881, Cl. 540-326.000.

Gerard, Chevereau; and Babin, Michel, to Framatome. Nuclear reactor lower internals. 4,960,561, Cl. 376-352.000.

Gergen, William P.; and Hart, William W. C., to Shell Oil Company. Blend of polyketone polymer with an amorphous polyamide polymer. 4,960,838, Cl. 525-426.000.

Gerhard D. Wempe KG, Firma: *See*—
Kienhofer, Gerhard, 4,960,232, Cl. 224-179.000.

Gerkin, Richard M.; and Kirchner, David L., to Union Carbide Chemicals and Plastics Company Inc. Process for the manufacture of N-(polyoxyalkyl)-N-(alkyl)amines. 4,960,942, Cl. 564-479.000.

Gernot, Philippe, to Labivia - S.G.E. Vehicle brake system with anti-locking device for the wheels and retarder with monitored actuation. 4,961,145, Cl. 364-426.020.

GESTA Gesellschaft fur Stahlrohrgeruste mbH: *See*—
Thiem, Gerhard, 4,960,185, Cl. 182-38.000.

Ghaoui, Labib, to Dow Chemical Company, The. Method for the determination of organic acids in an aqueous sample by; gas chromatography. 4,960,444, Cl. 55-67.000.

Ghislain, Michael. Pizza knife and holder. 4,959,905, Cl. 30-298.400.

Ghislanzoni, Luca, to Agence Spatiale Europeenne. Magnetically-coupled apparatus for measuring electrical current. 4,961,049, Cl. 324-117.00H.

Giannuzzi, Ottavio; and Woelfel, Walter, to Grumman Aerospace Corporation. Rivet orientation device and method. 4,960,360, Cl. 414-755.000.

Giberson, John W.: *See*—
Kreft, Anthony F., III; Musser, John H.; Bicksler, James J.; Giberson, John W.; and Kubrak, Dennis M., 4,960,892, Cl. 546-152.000.

Gidman, Claude J.: *See*—
Kaufman, William H.; Gidman, Claude J.; Harrison, Frederick A.; and Beekenkamp, Gerald, 4,959,912, Cl. 36-117.000.

Gilbert, David L.: *See*—
Thelen, William G.; May, Rodney E.; and Gilbert, David L., 4,960,296, Cl. 285-50.000.

Giles, Joseph M., to Selig Sealing Products, Inc. Partially laminated closure cap for tamper proof container and method of making same. 4,960,216, Cl. 215-232.000.

Gillette Canada Inc.: *See*—
Suhonen, Christopher H., 4,960,586, Cl. 424-52.000.

Gilliland, W. Keith; Midgley, Christian G.; Dana, Francis W.; and Mutch, Mark C., to Xerox Corporation. Monitor/warranty system for electrostatographic reproducing machines using replaceable cartridges. 4,961,088, Cl. 355-206.000.

Gillis, Marcel: *See*—
Puentes-Bravo, Eduardo; Gillis, Marcel; and Somers, Andreas J., 4,960,526, Cl. 252-8.800.

Gillis, Rolando. Cover structure for beverage cans or like containers. 4,960,225, Cl. 220-85.00H.

Gillonnier, Claude; and Moisson, Rene , to A.E.C. Process for preparing an aqueous solution of an alkali metal salt of methionine. 4,960,932, Cl. 562-559.000.

Gilot, Bernard: *See*—
Rousset, Abel; Maachi, Belsid; Gilot, Bernard; and Gougeon, Michel, 4,960,583, Cl. 423-633.000.

Gimenez-Gallego, Guillermo: *See*—
Garcia, Maria; and Gimenez-Gallego, Guillermo, 4,960,867, Cl. 530-324.000.

Gingras, Michel: *See*—
Daoust, Gilbert; and Gingras, Michel, 4,959,903, Cl. 30-123.500.

Givens, Cynthia: *See*—
Hong, Le Thieu; Givens, Cynthia; Liu, Ching Chao; Wright, Michael J.; and Fatehi, Feyzi, 4,961,139, Cl. 364-200.000.

Glaettli, Hans H.: *See*—
Stoll, Kurt; Glaettli, Hans H.; and Zofka, Stanislav, 4,960,393, Cl. 439-651.000.

Glaise, Rene: *See*—
Debord, Pierre; and Glaise, Rene, 4,961,193, Cl. 371-37.200.

Glaser, Charles: *See*—
Rice, Craig; Morser, Michael J.; Glaser, Charles; and Donner, Peter A., 4,960,702, Cl. 435-226.000.

Goble, E. Marlowe; and Somers, W. Karl. Channel ligament clamp and system. 4,960,420, Cl. 606-72.000.

Gobush, William, to Acushnet Company. Multiple dimple golf ball. 4,960,283, Cl. 273-232.000.

Godwin, Jimmy D.: *See*—
Williams, Roger O.; Kurtz, Milton C.; Godwin, Jimmy D.; Williams, Stephen P.; and Roberts, Gregory K., 4,961,123, Cl. 360-131.000.

Goetz, Norbert: *See*—
Hoelderich, Wolfgang; and Goetz, Norbert, 4,960,894, Cl. 546-250.000.
Hoelderich, Wolfgang; Goetz, Norbert; Hupfer, Leopold; and Himmele, Walter, 4,960,954, Cl. 568-691.000.

Goffe, William L.: *See*—
Elder, Fred A.; Foley, Geoffrey M. T.; and Goffe, William L., 4,960,665, Cl. 430-110.000.

Goldenfield, Mark P.; and Lambert, David V., to Westinghouse Electric Corp. Method and apparatus for reading lased bar codes on shiny-finished fuel rod cladding tubes. 4,960,984, Cl. 235-462.000.

Goldman, Robert P.; and Larson, John G., to Litton Systems, Inc. Faraday rotator assembly. 4,960,331, Cl. 356-350.000.

Goldstar Co., Ltd.: *See*—
Kim, Won-Tae, 4,960,385, Cl. 439-182.000.

Goldstar Semiconductor, Ltd.: *See*—
Baik, Woo H., 4,961,009, Cl. 307-296.800.

Goodley, Paul C.; and Hansen, Stuart C., to Hewlett-Packard Company. Multimode ionization source. 4,960,991, Cl. 250-281.000.

Goodman, Howard: *See*—
Smith, Douglas N.; and Goodman, Howard, 4,960,534, Cl. 252-145.000.

Goodyear Tire & Rubber Company, The: *See*—
Kim, Dong K.; and Shemenski, Robert M., 4,960,473, Cl. 148-12.00B.
Sandstrom, Paul H.; and Friedman, Emil M., 4,960,819, Cl. 524-516.000.
Wideman, Lawson G., 4,960,834, Cl. 525-333.200.

Gordon, Deborah C.; and Brunot, Frank A., to Paramed Technology Incorporated. Method and apparatus for continuously and non-invasively measuring the blood pressure of a patient. 4,960,128, Cl. 128-677.000.

Gordon, James F.: *See*—
Scheldorf, Gary O.; Gordon, James F.; and Scheldorf, Owen H., 4,960,372, Cl. 418-63.000.

Gordon, Julian; McMahon, Michael E.; and Ching, Shanfun, to Abbott Laboratories. Chromatographic test strip for determining ligands or receptors. 4,960,691, Cl. 435-6.000.

Goris, Andrew C.: *See*—
Fredrickson, Robert W.; and Goris, Andrew C., 4,961,153, Cl. 364-521.000.

Gorniak, Andrew M., to General DataComm, Inc. System and apparatus for providing three dimensions of input into a host processor. 4,961,138, Cl. 364-200.000.

Gorodisaky, Boris P.; and Sambursky, Alexandr I. Centrifuge. 4,960,406, Cl. 494-9.000.

Gortsema, Frank P.: *See*—
Pellet, Regis J.; Rabo, Jule A.; Long, Gary N.; Gortsema, Frank P.; and Springer, Albert R., 4,960,504, Cl. 208-411.000.

Gorzycki, Ken: *See*—
Hurley, Dennis; Anderson, Roy; and Gorzycki, Ken, 4,960,345, Cl. 405-38.000.

Gose, William C.: *See*—
Hyche, Kenneth W.; and Gose, William C., 4,960,644, Cl. 428-407.000.

Gotlib, Vladimir A.: *See*—
Alexandrov, Maxim L.; Belenky, Boris G.; Gotlib, Vladimir A.; Vlasov, Arkady P.; Komarov, Nikolai N.; Sudiiin, Valery V.; and Shevkunov, Vsevolod V., 4,960,516, Cl. 210-198.200.

Goto, Toru: *See*—
Toida, Shouji; Iwasaki, Kazunori; Goto, Toru; and Tsuchiya, Shigeru, 4,960,218, Cl. 215-311.000.

Gougeon, Michel: *See*—
Rousset, Abel; Maachi, Belaid; Gilot, Bernard; and Gougeon, Michel, 4,960,583, Cl. 423-633.000.

Grady, John K.: *See*—
Sebring, John P., 4,960,271, Cl. 269-323.000.

Granbom, Bo. Apparatus in pressurized fluid cylinders not having piston rods. 4,960,037, Cl. 92-88.000.

Grancini, Gian Carlo: *See*—
Carenzi, Angelo; Chiarino, Dario; Della Bella, Davide; Grancini, Gian Carlo; and Veneziani, Carlo, 4,960,788, Cl. 514-424.000.

Grand Hall Enterprise Co., Ltd.: *See*—
Home, William, 4,960,101, Cl. 126-41.00R.

Grandjean, Daniel; Seurre, Jean-Michel; and Zastko, Didier, to Compagnie Europeenne de Composants Electroniques LCC. Electromagnetic delay line comprising several cascaded sections. 4,961,060, Cl. 333-140.000.

Granetzke, Dennis, to Modien Manufacturing Co. Baffle for tubular heat exchanger header. 4,960,169, Cl. 165-173.000.

Granquist, Victor M.: *See*—
House, Roy F.; Granquist, Victor M.; and Cowan, Jack C., 4,960,740, Cl. 501-148.000.

Granskog, Roland, to Alimak AB. Equipment for raise mining. 4,960,175, Cl. 175-86.000.

Grass Valley Group, Inc., The: *See*—
White, Charles, 4,961,114, Cl. 358-183.000.

Grasselli, Robert K.: *See*—
Suresh, Dev. D.; Grasselli, Robert K.; Ratka, Frances I.; and Brazdil, James F., 4,960,921, Cl. 558-325.000.

Graves, John G. Rotatably driven positive displacement pump. 4,960,369, Cl. 417-536.000.

Gray, Gerald A., Jr.; and Webb, John L., to Xerox Corporation. Large media proportional copying system. 4,961,090, Cl. 355-50.000.

Gray, Randall C.; and Edwards, Arthur, to Motorola, Inc. Floating output digital to analog converter. 4,961,045, Cl. 323-273.000.

Greene, Carol J.: *See*—
Wu, Stephen H. W.; Greene, Carol J.; and Sharma, Mahendra K., 4,960,814, Cl. 524-312.000.

Greenman, Barbara J.: *See*—
Butler, Donald E.; and Greenman, Barbara J., 4,960,931, Cl. 562-507.000.

Greenwald, Howard J.: *See*—
Wang, Xingwu; and Royston, James D., 4,960,760, Cl. 505-1.000.

Greenway, John M.; Schortmann, Walter E.; Mancini, Peter; Metrick, Dennis; and Connolly, Timothy, to International Paper Company. Apparatus for producing symmetrical fluid entangled non-woven fabrics and related method. 4,960,630, Cl. 428-131.000.

Gregory, Glenn R. Nail set device. 4,960,235, Cl. 227-147.000.

Gribb, Tye T.: *See*—
Klein, Gary G.; and Gribb, Tye T., 4,960,402, Cl. 474-80.000.

Gribou, Henry G. Methods and compositions for relief of stomach distress. 4,960,591, Cl. 424-93.000.

Grill, Helmut: *See*—
Woschina, Axel; and Grill, Helmut, 4,960,937, Cl. 564-324.000.

Grimanis, Michael P.: *See*—
Nunes, Maurice; Grimanis, Michael P.; Hurley, James R.; and Shukla, Kailash C., 4,960,377, Cl. 431-12.000.

Grimes, Dwight W., to International Business Machines Corporation. Data error detection and correction. 4,961,192, Cl. 371-37.100.

Grimm, William G.: *See*—
Pott, Ronald W.; and Grimm, William G., 4,960,137, Cl. 144-349.000.

Groke, Karl: *See*—
Reichel, Erich; Schmidt-Kloiber, Heinz; and Groke, Karl, 4,960,108, Cl. 128-24.00A.

Grooters, Ronald K. Method of replacing a defective atrio-ventricular valve with a total atrio-ventricular valve bioprosthesis. 4,960,424, Cl. 623-2.000.

Grossi, Lucio. Device for frothing and heating milk for beverages. 4,960,042, Cl. 99-293.000.

Grubb, Michael J.: *See*—
Robb, Richard A.; and Grubb, Michael J., 4,960,142, Cl. 134-138.000.

Gruenberg, Eric I.; Halicho, James J.; Phillips, Melvin J.; and Hulick, Troy K., to Apple Computer, Inc. Center pivot cover. 4,959,887, Cl. 16-223.000.

Grumman Aerospace Corporation: *See*—
Giannuzzi, Ottavio; and Woelfel, Walter, 4,960,360, Cl. 414-755.000.

Grundig E.M.V. Elektromechanische Versuchsanstalt: *See*—
Gukkenberger, Horst; and Eberle, Karl, 4,960,498, Cl. 204-192.200.

Grundy, James, to Johnson Matthey Inc. Process for the reactive treating of palladium to form a protective coating and article. 4,960,647, Cl. 428-472.100.

GTE Products Corporation: *See*—
White, Robert S.; Wyner, Elliot F.; and Scholz, John A., 4,961,019, Cl. 313-25.000.

Guardian Industries Corp.: *See*—
Lingle, Philip J., 4,960,645, Cl. 428-432.000.

Guile, Donald L.; and Martin, Dandy, to Corning Incorporated. Calcium dialuminate/hexaluminate ceramic structures. 4,960,737, Cl. 501-125.000.

Guillemin, Lucien: *See*—
Vigneron, Gilbert; Bezier, Jean; Nguyen-Thanh, Thong; Vidal, Pierre; Zacharie, Guy; and Guillemin, Lucien, 4,960,650, Cl. 428-594.000.

Guirguis, Raouf A., to Cancer Diagnostics, Inc. Modular fluid sample preparation assembly. 4,960,130, Cl. 128-760.000.

Gukkenberger, Horst; and Eberle, Karl, to Grundig E.M.V. Elektromechanische Versuchsanstalt. Method of manufacturing a magnetic head. 4,960,498, Cl. 204-192.200.

Gummer, Allen L.; Choinski, Graydon J.; and Brooks, David W., to Indian Head Industries, Inc. Tamper-resistant brake actuator. 4,960,036, Cl. 92-63.000.

Gumprecht, William H., to Du Post de Nemours, E. I., and Company. Process for purifying hydrogen fluoride. 4,960,580, Cl. 423-484.000.

Gumprecht, William H., to Du Pont de Nemours, E. I., and Company. Spent antimony halide catalysts treatment. 4,960,742, Cl. 502-24.000.

Gupta, Vijay K., to BNR Inc. PBX system with assignable relationships between network loops and ports. 4,961,187, Cl. 370-85.120.

Gymer, Geoffrey E.; and Richardson, Kenneth, to Pfizer Inc. Triazole antifungal agents. 4,960,782, Cl. 514-383.000.

Gyory, Peter: *See*—
Szalay, Erzsebet; Lugosi, Gyorgy; Kallay, Tamas U.; Nad, Zsuzsanna; Jelinek, Istvan; Simonidesz, Vilmos; Gyory, Peter; Nagy, Lajos; Lugosi, Marta; Santa nee Singola, Ilona; Besenyei, Gabor; and Simandi, Laszlo , 4,960,913, Cl. 552-206.000.

Gyu, Choi I.: *See*—
Youn, Han S.; Dong, Kim, Il; and Gyu, Choi I., 4,960,812, Cl. 524-291.000.

H. Lundbeck A/S: *See*—
Krogsgaard-Larsen, Povl; Falch, Erik; and Pedersen, Henrik, 4,960,769, Cl. 514-215.000.

Haataja, Bruce A.: *See*—
DeBruine, Gordon R.; Haataja, Bruce A.; and Sandberg, L. Bogue, 4,960,553, Cl. 264-113.000.

Habekost, Charles F. Self-contained periodontal probe for remote recordations. 4,960,132, Cl. 128-776.000.

Habib, Joseph; Nielsen, Paul; and Nielsen, Paul H., to Vickers, Incorporated. Linear capacitance displacement transducer. 4,961,055, Cl. 324-662.000.

Hackenberg, Wolfgang, to SMS Schloemann-Siemag Aktiengesellschaft. Rolling mill stand with manipulator. 4,959,987, Cl. 72-247.000.

Haderle, Donald J.: *See*—
Crus, Richard A.; Haderle, Donald J.; and Teng, James Z., 4,961,134, Cl. 364-200.000.

Hadfield, Susan G.; and Norrington, Franklin E. A., to Burroughs Wellcome Co. Diagnostic test methods. 4,960,713, Cl. 436-523.000.

Hadfield Susan G.; and Norrington, Franklin E. A., to Burroughs Wellcome Co. Diagnostic test methods. 4,960,714, Cl. 436-523.000.

Hadfield, Susan G.; and Norrington, Franklin E. A., to Burroughs Wellcome Co. Diagnostic test methods. 4,960,715, Cl. 436-523.000.

Haga, Nobuhiro: *See*—
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Esna-Ashari, Mohammed; Kellerwessel, Hans; Gemmer, Ludwig; and Hamacher, Gert-Helge, 4,960,461, Cl. 423-27.000.

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Goodley, Paul C.; and Hansen, Stuart C., 4,960,991, Cl. 250-281.000.

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Gergen, William P.; and Hart, William W. C., 4,960,838, Cl. 525-426.000.

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Tajima, Ikuo; and Hasegawa, Hideo, 4,960,061, Cl. 112-103.000.

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Hasegawa, Tetsuo: *See*—
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Haug, Werner: *See*—
Muller, Jurgen; Schmidt, Manfred; Wauer, Dieter; Zehetmaier, Thomas; Brys, Georges; Schoeters, Emile; Haug, Werner; and Bauer, Walter, 4,960,994, Cl. 250-327.200.

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Hawkins, John W.: *See*—
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Hayakawa, Hiroshi: *See*—
Takahashi, Yutaka; Harashima, Ikuo; Nakayama, Sunichi; Arai, Yasuyuki; Takayanagi, Yasushi; Sekiguchi, Ryoichi; Abe, Tomomitsu; and Hayakawa, Hiroshi, 4,960,228, Cl. 222-129.100.

Hayasaka, Ryozo: *See*—
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Kuroda, Kouichi; Hayashi, Chihiro; and Nakasuji, Kazuyuki, 4,959,985, Cl. 72-97.000.

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Watanabe, Shoichi; Takei, Takayuki; Hayashi, Terumine; and Natabe, Takashi, 4,960,724, Cl. 437-51.000.

Hayashi Tokei Kogyo Kabushiki Kaisha: *See*—
Tanaka, Hiroaki, 4,961,028, Cl. 315-91.000.

Hayashibara, Ken: *See*—
Masaki, Kazumi, 4,960,124, Cl. 128-421.000.
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Hayashida, Teruki: *See*—
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Heger, Adolf: *See*—
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Hegg, Ronald G.: *See*—
Smith, Ronald T.; and Hegg, Ronald G., 4,960,314, Cl. 350-3.700.

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Junghans, Rudi, 4,960,052, Cl. 101-350.000.

Heiland, Wolfgang K.: *See*—
Dalby, Glenn R.; and Heiland, Wolfgang K., 4,960,525, Cl. 210-788.000.

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Kumpe, Gerhardt; Wormsbacher, Wilfried; Heimburger, Norbert; Fuhge, Peter; and Preis, Hans M., 4,960,757, Cl. 514-21.000.

Heinemann, Jan M.: *See*—
Fovell, Richard C.; Heinemann, Jan M.; and Heinemann, Klaus W., 4,960,569, Cl. 422-186.190.

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Heja, Gergely: *See*—
Korbonits, Dezso ; Heja, Gergely; Szomor, Maria; and Minker, Emil, 4,960,773, Cl. 514-234.210.

Helene Curtis, Inc.: *See*—
Hoshowski, Myra A.; and Zeffren, Eugene, 4,960,588, Cl. 424-71.000.

Helfritch, Dennis J., to Research-Cottrell. Process for removing SO_2 and fly ash from flue gas. 4,960,445, Cl. 55-5.000.

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Buffenoir, Marc; Pierret, Rene ; Hellegouarc'h, Jean; and Prost, Gerard, 4,960,967, Cl. 219-10.491.

Hellings, Gerardus J. A.; Van Der Heijden, Antonius W. F.; Himmelbauer, Erich E.; Vrijssen, Gerardus A. H. M.; Spanjer, Tjerk G.; Van Alphen, Willem M.; and Van Engelshoven, Jeroen, to U.S. Philips Corporation. Display tube including a helical focusing lens with a non-rotationally symmetrical lens element. 4,961,022, Cl. 313-414.000.

Heminger, David M.: *See*—
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Hemmat, Naim S., to Electric Power Research Institute. Casting nozzle with discharge slot defined by refractory inserts. 4,960,245, Cl. 239-597.000.

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Henderson, Donald L.; and Henderson, Elden O., Jr., 4,959,882, Cl. 15-250.040.

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Vedage, Gamini A.; Henderson, William W.; Toseland, Bernard A.; and Deeba, Michel, 4,960,941, Cl. 564-450.000.

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Hensman, John R.: *See*—
Harrison, George E.; and Hensman, John R., 4,960,960, Cl. 568-881.000.

Henson, Kerry L. Self-propelled vehicle. 4,960,286, Cl. 280-247.000.

Herlitz, Nils G.; Iglehart, Karl L.; and Sentell, John S., to Safe T. V., Inc. Video inspection system for hazardous environments. 4,961,111, Cl. 358-100.000.

Hermes, Dirk J., to U.S. Philips Corporation. Method of and device for encoding a signal, for example a speech parameter such as the pitch, as a function of time. 4,961,228, Cl. 381-41.000.

Herrerq, Juan J. P.: *See*—
Colom, Roberto C.; Duque Ros, Jordi J.; and Herrerq, Juan J. P., 4,960,429, Cl. 8-94.260.

Herrules Equipment Corporation: *See*—
Robb, Richard A.; and Grubb, Michael J., 4,960,142, Cl. 134-138.000.

Hess, Bernhard: *See*—
Kloker, Werner; Freitag, Dieter; Uerdingen, Walter; Hess, Bernhard; and Schmid, Helmut, 4,961,179, Cl. 369-288.000.

Hewlett-Packard Company: *See*—
Cowger, Bruce, 4,961,076, Cl. 346-1.100.
Fredrickson, Robert W.; and Goris, Andrew C., 4,961,153, Cl. 364-521.000.
Goodley, Paul C.; and Hansen, Stuart C., 4,960,991, Cl. 250-281.000.
Hong, Le Thieu; Givens, Cynthia; Liu, Ching Chao; Wright, Michael J.; and Fatehi, Feyzi, 4,961,139, Cl. 364-200.000.
Obermeyer, John R., Jr.; Shelton, John F.; and Williamson, Donald A., 4,961,013, Cl. 307-480.000.

Hewson, Carl E., to Brunswick Manufacturing Co., Inc. Esophageal electrode. 4,960,133, Cl. 128-784.000.

Hibi, Toshifumi; and Nakano, Masaki, to Nissan Motor Co., Ltd. Continuously variable traction roller transmission. 4,960,004, Cl. 74-200.000.

Hibino, Hiroki: *See*—
Kubokawa, Hiroaki; Tsukaya, Takashi; Ueda, Yasuhiro; Nakamura, Takeaki; Ohshima, Yutaka; Hibino, Hiroki; Takayama, Shyuichi; and Hagino, Tadao, 4,960,106, Cl. 128-6.000.

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Hightower, Michael L.: *See*—
Tentler, Michael L.; and Hightower, Michael L., 4,961,220, Cl. 379-413.000.

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Ohshita, Takahiro; Higo, Tsutomu; and Mizoguchi, Yukio, 4,960,057, Cl. 110-345.000.

Higuchi, Hiroshi: *See*—
Miyaoka, Shuuichi; Odaka, Masanori; Higuchi, Hiroshi; and Arai, Toshikazu, 4,961,164, Cl. 365-177.000.

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Ozeki, Osamu; Higuchi, Kazunori; and Yamamoto, Shin, 4,961,155, Cl. 364-559.000.

Higuchi, Seizun: *See*—
Wada, Toshiya; Tanaka, Osamu; Egawa, Takatoshi; Yoshida, Makato; Higuchi, Seizun; and Izaki, Teruaki, 4,960,652, Cl. 428-611.000.

Higuchi, Teruo, to Sanden Corporation. Slant plate type compressor with variable displacement mechanism. 4,960,366, Cl. 417-222.000.

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Hilby, James A.: *See*—
Faye, Bradley D.; Hilby, James A.; Alff, Denis; and Hajzler, Christian, 4,960,333, Cl. 384-448.000.

Hilgarth, Kurt, to Skischuhfabrik Dynafit Gesellschaft mbH. Ski-boot. 4,959,914, Cl. 36-120.000.

Hilgert, Raymond A.: *See*—
Bruck, Gerald J.; Hilgert, Raymond A.; and Whitlow, Graham A., 4,960,472, Cl. 148-127.000.

Hilmont Incorporated: *See*—
Sevini, Franco; and Noristi, Luciano, 4,960,593, Cl. 524-99.000.
Himmelbauer, Erich E.: *See*—
Hellings, Gerardus J. A.; Van Der Heijden, Antonius W. F.; Himmelbauer, Erich E.; Vrijssen, Gerardus A. H. M.; Spanjer, Tjerk G.; Van Alphen, Willem M.; and Van Engelshoven, Jeroen, 4,961,022, Cl. 313-414.000.
Himmele, Walter: *See*—
Hoelderich, Wolfgang; Goetz, Norbert; Hupfer, Leopold; and Himmele, Walter, 4,960,954, Cl. 568-691.000.
Himmelreich, Rolf: *See*—
Spiess, Wolfram; and Himmelreich, Rolf, 4,960,933, Cl. 562-882.000.
Hine, Nathan P.: *See*—
Hoisington, Paul A.; Hine, Nathan P.; and Spehrley, Charles W., Jr., 4,961,082, Cl. 346-140.00R.
Hioki, Yasuhiro: *See*—
Matsuda, Shunsuke; Hioki, Yasuhiro; and Ueda, Masaaki, 4,961,178, Cl. 369-103.000.
Hipps, Jesse, Sr.: *See*—
Hammann, William A., IV; Liang, Rong-Chang; Thomas, Teresa M.; and Hipps, Jesse, Sr., 4,960,750, Cl. 503-214.000.
Hirakawa, Noboru, to NEC Corporation. Multi-level wiring structure of semiconductor device. 4,961,104, Cl. 357-71.000.
Hirano, Susumu: *See*—
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Sakanoue, Kei; Ishii, Yoshio; and Hirano, Tsumoru, 4,960,688, Cl. 430-548.000.
Hiraoka, Eiichi; and Onaka, Junji. Pressure vessel. 4,960,221, Cl. 220-3.000.
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Hirofuji, Satoshi: *See*—
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Hirt, John H., 4,960,166, Cl. 165-9.000.
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Hitachi Automotive Engineering Co., Ltd.: *See*—
Abukawa, Toshimi; Okuyama, Toshiaki; Tahara, Kazuo; Marumoto, Katsuji; Koterazawa, Toshiyuki; Hombu, Mitsuyuki; Takahashi, Tadashi; Ishikura, Hisatugu; Yamamura, Hirohisa; Tatsuzaki, Toru; Omae, Tsutomu; and Takamatsu, Shuichi, 4,960,178, Cl. 180-79.100.
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Ide, Akira; and Saito, Yoshikazu, 4,961,011, Cl. 307-446.000.
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Nishijima, Tsunemasa, 4,959,954, Cl. 60-39.020.
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Oguro, Hiroki; Okuyama, Nobutaka; and Nakahara, Masaki, 4,961,021, Cl. 313-412.000.
Saho, Norihide; Nemoto, Takeo; Ogata, Hisanao; and Saeki, Mitsuru, 4,959,964, Cl. 62-51.100.
Saito, Atsushi; and Maeda, Takeshi, 4,961,182, Cl. 369-124.000.
Sakai, Kazuo; Terayama, Takao; and Morikawa, Juichi, 4,961,122, Cl. 360-107.000.
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Shimada, Junichi; Kobayashi, Kazutoshi; Moriyama, Norio; and Kawakami, Kazuhiko, 4,960,099, Cl. 123-647.000.
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Tanaka, Toshiaki; Kajimura, Takashi; Kawano, Toshihiro; and Ono, Yuichi, 4,961,197, Cl. 372-45.000.
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Yamamoto, Hiroshi, 4,961,105, Cl. 357-72.000.
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Nozawa, Yasuto; Tanigawa, Shigeho; and Iwasaki, Katsunori, 4,960,474, Cl. 148-302.000.
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Akiyama, Tadahiko, 4,961,217, Cl. 379-89.000.
Hiza, Misao; Yamazaki, Hajime; Sugihara, Kazuhiro; and So, Tetsu, to Yokohama Rubber Co., Ltd., The. Microwave-absorptive composite. 4,960,633, Cl. 428-215.000.
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Hoare, John H., to FMC Corporation. Process to dehydrohalogenate esters of pentahalopropyldimethylcyclopropanecarboxylic acids using a catalytic amount of 1,8-diazabicyclo[(5.4.0]Undecene-7-Ene in combination with stoichiometric amounts of base. 4,960,922, Cl. 560-124.000.
Hochstein, Peter A. Rain sensor with reference channel. 4,960,996, Cl. 250-349.000.
Hodge, Bobby L., to Ina Bearing Company, Inc. Concentric slave cylinder. 4,960,193, Cl. 192-91.00A.
Hodogaya Chemical Co., Ltd.: *See*—
Okabe, Kazuaki; Ishii, Hideyuki; Watanabe, Haruo; and Takeuchi, Shuichi, 4,960,849, Cl. 528-76.000.
Hoechst Aktiengesellschaft: *See*—
Bartels, Gunter, 4,960,920, Cl. 558-170.000.
Dietz, Erwin; Hoffmann, Erich; and Weide, Joachim, 4,960,935, Cl. 564-325.000.
Erdelen, Christian; Ringsdorf, Helmut; Prass, Werner; and Scheunemann, Ude, 4,960,635, Cl. 428-220.000.
Kleiner, Hans-Jerg; and Roscher, Gunter, 4,960,919, Cl. 558-142.000.
Lachhein, Stephen; and Ressel, Hans-Joachim, 4,960,887, Cl. 544-320.000.
Papenfuhs, Theodor, 4,960,929, Cl. 562-430.000.
Papenfuhs, Theodor; and Geisenberger, Josef, 4,960,940, Cl. 564-440.000.
Schlafer, Ludwig; Schwaiger, Gunther; and Russ, Werner H., 4,960,872, Cl. 534-642.000.
Wehowsky, Frank; Kleber, Rolf; and Jaeckel, Lothar, 4,960,543, Cl. 560-26.000.
Hoechst Aktiengesellschaft Knapsack: *See*—
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Hoechst Celanese Corporation: *See*—
Wadhwa, Lachhman H.; and Steurer, Andrew M., 4,960,813, Cl. 524-311.000.
Hoechst-Roussel Pharmaceuticals Inc.: *See*—
Shutske, Gregory M.; and Kapples, Kevin J., 4,960,767, Cl. 514-211.000.
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Hoffmann, Kurt: *See*—
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Hoshino, Tatsuo; Nomura, Setsuko; and Sugisawa, Teruhide, 4,960,695, Cl. 435-42.000.
Hofmeister, Peter: *See*—
Neubauer, Hans-Juergen; Buerstinghaus, Rainer; Kuenast, Christoph; and Hofmeister, Peter, 4,960,796, Cl. 514-624.000.
Hogenkamp, Wilhelm, to Otto Hansel GmbH. Reciprocal conveyor carriage for spacing groups of candy. 4,960,198, Cl. 198-419.200.

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Hoke, Steven H., to United States of America, Army. Atmospheric HCl monitor. 4,960,496, Cl. 204-153.130.

Holcomb, David A., to Chef'N Corporation. Cheese dispenser. 4,960,024, Cl. 83-423.000.

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Holder, Tommie J.: *See*—
Sullivan, Robert W.; Holder, Tommie J.; and Buchanan, Max F., 4,960,082, Cl. 123-43.00A.

Holker, David G.: *See*—
Newkirk, Raymond K.; and Holker, David G., 4,960,478, Cl. 156-228.000.

Holl, Roland: *See*—
Hummel, Peter; and Holl, Roland, 4,960,053, Cl. 101-350.000.

Holland, Floyd H., to Phillips Petroleum Company. Process for conversion of oils to hydrocarbon products. 4,960,502, Cl. 208-85.000.

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Tam, Simon M.; Holler, Mark A.; and Castro, Hernan A., 4,961,002, Cl. 307-201.000.

Hollis, C. George; and Rayudu, S. Rao, to Buckman Laboratories International, Inc. Novel polymeric quaternary ammonium trihalides. 4,960,590, Cl. 424-78.000.

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Hombu, Mitsuyuki: *See*—
Abukawa, Toshimi; Okuyama, Toshiaki; Tahara, Kazuo; Marumoto, Katsuji; Koterazawa, Toshiyuki; Hombu, Mitsuyuki; Takahashi, Tadashi; Ishikura, Hisatugu; Yamamura, Hirohisa; Tatsuzaki, Toru; Omae, Tsutomu; and Takamatsu, Shuichi, 4,960,178, Cl. 180-79.100.

Home, William, to Grand Hall Esterprise Co., Ltd. Assembly for a variable position gas barbecue burner. 4,960,101, Cl. 126-41.00R.

Homola, Andrew M.; Lin, Li-Ju J.; and Saperstein, David D., to International Business Machines Corporation. Process for bonding lubricant to a thin film magnetic recording disk. 4,960,609, Cl. 427-38.000.

Honda Giken Kogyo Kabushiki Kaisha: *See*—
Koike, Yazuru; Miyashita, Yukio; Akimoto, Yoshiaki; Seki, Yasunari; and Yahata, Isao, 4,960,094, Cl. 123-425.000.
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Kumagai, Yomoharu; Hirose, Masato; and Nishikawa, Masao, 4,960,040, Cl. 92-261.000.
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Okuda, Akihito; Katagiri, Yoshihiro; and Aoki, Hiromi, 4,959,959, Cl. 60-489.000.
Seki, Yasunari; and Yahata, Isao, 4,960,083, Cl. 123-90.160.

Honda, Takenobu, to Mitsubishi Denki Kabushiki Kaisha. Elevator hoist apparatus with an outer rotor motor. 4,960,186, Cl. 187-20.000.

Honeycutt, Travis W., to Derma-Lock Medical Corporation. Polyurethane foam dressing. 4,960,594, Cl. 424-445.000.

Hong, Le Thieu; Givens, Cynthia; Liu, Ching Chao; Wright, Michael J.; and Fatehi, Feyzi, to Hewlett-Packard Company. Data base management system for real-time applications. 4,961,139, Cl. 364-200.000.

Hong, Paul O.: *See*—
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Honkura, Yoshinobu; Nakashima, Yoshihiro; Matsuo, Toru; and Murata, Kouji, to Aichi Steel Works, Ltd. Method for manufacturing a high strength stainless steel. 4,960,470, Cl. 148-12.00E.

Hope, Henry F.; and Hope, Stephen F. Lightweight batteries. 4,960,655, Cl. 429-192.000.

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Hopkins, Martin E.; and Warren, Henry S., Jr., to International Business Machines Corporation. Generating efficient code for a computer with dissimilar register spaces. 4,961,141, Cl. 364-200.000.

Hopmans, Fransiscus P. M.: *See*—
Augusteijn, Alexander; and Hopmans, Fransiscus P. M., 4,961,137, Cl. 364-200.000.

Hoppe, Kalus-Dieter: *See*—
Mueller, Michael W.; Hoppe, Kalus-Dieter; Schwab, Ekkehard; Steck, Werner; Auweter, Helmut; and Feser, Rainer, 4,960,462, Cl. 75-252.000.

Hori, Hideo: *See*—
Yabe, Hideo; and Hori, Hideo, 4,961,144, Cl. 364-424.050.

Hori, Saburo; and Kurita, Ryuichi, to Kureha Chemical Industry Co., Ltd. Mullite-alumina composite sintered body and process for producing the same. 4,960,738, Cl. 501-128.000.

Horiuchi, Hiromi: *See*—
Yoshitomi, Toshihiko; Yushina, Heihachi; Horiuchi, Hiromi; Yamaguchi, Yukio; Kamoshita, Yasuo; and Sekihara, Kiyoshi, 4,960,668, Cl. 430-122.000.

Horiuchi, Hitoshi, to Daikin Industries, Ltd. Hydraulic control apparatus. 4,960,365, Cl. 417-222.000.

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Horner, Patrick J.: *See*—
Towle, Ian D. H.; and Horner, Patrick J., 4,960,835, Cl. 525-398.000.

Horodysky, Andrew G.; and Wu, Shi-Ming, to Mobil Oil Corporation. Diacyl halides with amines and phosphites as multifunctional lubricant additives. 4,960,529, Cl. 252-32.500.

Hortensius, Peter: *See*—
McLeod, Robert; Card, Howard; Hortensius, Peter; and Pries, Werner, 4,961,159, Cl. 364-717.000.

Hoshikawa, Hiroshi: *See*—
Aoki, Toyoaki; Kawakami, Kouji; Tanaka, Yoshiharu; and Hoshikawa, Hiroshi, 4,960,711, Cl. 436-124.000.

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Minari, Katsunobu, 4,959,971, Cl. 62-197.000.

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Hosokawa, Akemi: *See*—
Takematsu, Tetsuo; Yoneyama, Kouichi; Jikihara, Tetsuo; Katsurada, Manabu; Shike, Toyohiko; Hosokawa, Akemi; Mikami, Emiko; and Ikeda, Osamu, 4,960,897, Cl. 546-346.000.

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Nakasa, Masayuki; Ishikawa, Norio; and Hosomizu, Hiroshi, 4,961,083, Cl. 354-145.100.

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House, David W.; and Scott, Ray V., Jr., to UOP. Coating method for room-temperature-cured polyurethanes and polyureas. 4,960,620, Cl. 427-385.500.

House, Roy F.; Granquist, Victor M.; and Cowan, Jack C., to Venture Innovations, Inc. Organophilic clay compositions. 4,960,740, Cl. 501-148.000.

Houziaux, Patrick: *See*—
Danree, Bernard; Houziaux, Patrick; Lacolle, Jean-Yves; and Riffaud, Jean-Pierre, 4,960,900, Cl. 548-203.000.

Howard, Harry R., Jr.; and Sarges, Reinhard, to Pfizer Inc. Indolinone derivatives. 4,960,785, Cl. 514-411.000.

Howden Food Equipment, Inc.: *See*—
Tribert, Claude, 4,960,156, Cl. 141-1.000.

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Baliga, Bantval J.; Chang, Hsueh-Rong; and Howell, Edward K., 4,961,100, Cl. 357-39.000.

Howells, Roger A., to Air Products and Chemicals, Inc. Method and apparatus for preventing binding and overloading of media feed screw conveyor. 4,959,931, Cl. 51-436.000.

Howsam, Christopher G.: *See*—
Smith, Brian D.; Court, Nigel T.; and Howsam, Christopher G., 4,960,383, Cl. 434-430.000.

Hoya Corporation: *See*—
Kasuga, Toshihiro; Yoshida, Masahiro; Uno, Tomoko; and Nakajima, Kiichi, 4,960,733, Cl. 501-10.000.

Hsiao, K. H. Hand tool for mounting or dismounting bicycle cranks. 4,960,017, Cl. 81-459.000.

Hsu, Ming-Huei. Spare keys and card for retaining them. 4,959,983, Cl. 70-456.00R.

Hubbell Incorporated: *See*—
Schnell, Kenneth R.; and Slater, William E., 4,960,964, Cl. 174-51.000.

Hubert, Guenter: *See*—
Finkenzeller, Johann; and Hubert, Guenter, 4,961,000, Cl. 250-484.100.

Hubert, Philippe; and Martin, Eric, to Novatome. Device for compensating by supplying a measured amount of fluid and its application for replenishing a hydraulic circuit. 4,960,152, Cl. 137-559.000.

Huels Aktiengesellschaft: *See*—
Thelen, Gerhard, 4,960,959, Cl. 568-855.000.

Huemmer, Wolfgang: *See*—
Beck, Erich; Bronstert, Bernd; Huemmer, Wolfgang; and Littmann, Dieter, 4,960,673, Cl. 430-271.000.

Huetter, Horst, to Messerschmitt-Boelkow-Blohm GmbH. Apparatus for locking and unlocking a safety for subammunition bodies. 4,960,032, Cl. 89-1.510.

Hughes Aircraft Company: *See*—
Moss, Gaylord E.; and Wreede, John E., 4,960,311, Cl. 350-3.660.
Schotter, Daniel K., 4,960,068, Cl. 118-123.000.
Smith, Ronald T.; and Hegg, Ronald G., 4,960,314, Cl. 350-3.700.
Troup, Sue, 4,960,493, Cl. 204-32.100.

Hughson, Gary W.: *See*—
Kalaam, Shaik M.; and Hughson, Gary W., 4,959,876, Cl. 2-93.000.

Hulick, Troy K.: *See*—
Gruenberg, Eric I.; Halicho, James J.; Phillips, Melvin J.; and Hulick, Troy K., 4,959,887, Cl. 16-223.000.
Hummel, Peter; and Holl, Roland, to Man Roland Druckmaschinen AG. Vibrator control for inking units of printing presses. 4,960,053, Cl. 101-350.000.
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Dube, Ghyslain; Huni, Jean-Paul; Lavoie, Serge; and Stevens, Wesley D., 4,960,460, Cl. 75-10.190.
Hupfer, Leopold: *See*—
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Hurley, Dennis; Anderson, Roy; and Gorzycki, Ken, to Turf Drain Company of America, Inc. System for construction of golf course sand bunkers. 4,960,345, Cl. 405-38.000.
Hurley, James R.: *See*—
Nunes, Maurice; Grimanis, Michael P.; Hurley, James R.; and Shukla, Kailash C., 4,960,377, Cl. 431-12.000.
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Huth, Andreas: *See*—
Biere, Helmut; Huth, Andreas; Rahtz, Dieter; Schmiechen, Ralph; Seidelmann, Dieter; Stephens, David; Engelstoft, Mogens; and Hansen, John B., 4,960,777, Cl. 514-253.000.
Hwo, Charles C., to Shell Oil Company. Compositions and articles using high melt flow poly-1-butene and polypropylene blends. 4,960,820, Cl. 524-528.000.
Hyche, Kenneth W.; and Gose, William C., to Eastman Kodak Company. Aqueous additive systems, methods and polymeric particles. 4,960,644, Cl. 428-407.000.
Hydro-Pac, Inc.: *See*—
Robertson, Jason L., 4,960,039, Cl. 92-165.00R.
Hypeco AB: *See*—
Stenlund, Stig, 4,960,167, Cl. 165-40.000.
Ibbotson, Dale E.: *See*—
Chang, Chorng-Ping; Flamm, Daniel L.; Ibbotson, Dale E.; and Mucha, John A., 4,960,656, Cl. 428-704.000.
Ibukuro, Sadao, to Fujitsu Limited. Automatic gain control amplifier for compensating cable loss. 4,961,057, Cl. 330-295.000.
ICF Compagnia Italiana Finanaziaria SpA: *See*—
Magnani, Sivio, 4,960,616, Cl. 427-186.000.
Ichikawa, Yasuo: *See*—
Kato, Toshikiyo; Ichikawa, Yasuo; Ito, Wataru; Ikeda, Hiroshi; and Kamata, Yoshio, 4,960,337, Cl. 400-248.000.
Ichinose, Yusaku; and Imamura, Hitoshi, to Enya Mfg. Co., Ltd. Automatic wafer mounting device. 4,960,485, Cl. 156-556.000.
ICI Americas Inc.: *See*—
Woolard, Frank X., 4,960,457, Cl. 71-95.000.
Ide, Akira; and Saito, Yoshikazu, to Hitachi, Ltd. BiMOS current mirror. 4,961,011, Cl. 307-446.000.
Idemitsu Kosan Company Limited: *See*—
Seiki, Hiromichi, 4,960,542, Cl. 252-565.000.
Idemitsu Petrochemical Company Limited: *See*—
Yamada, Toyokazu, 4,960,648, Cl. 428-476.300.
Idesawa, Masanori, to Rikagaku Kenkyusho. Semiconductor image position sensitive device with primary and intermediate electrodes. 4,961,096, Cl. 357-30.000.
Iglehart, Karl L.: *See*—
Herlitz, Nils G.; Iglehart, Karl L.; and Sentell, John S., 4,961,111, Cl. 358-100.000.
Iglesia, Enrique; Soled, Stuart L.; and Fiato, Rocco A., to Exxon Research and Engineering Company. Synthesis gas to heavy hydrocarbons on SiO_2 promoted CO/TiO_2. 4,960,801, Cl. 518-715.000.
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Kakino, Yoshiaki; Ihara, Yukitoshi; Yonetani, Mitsuo; and Teshima, Takeo, 4,961,034, Cl. 318-600.000.
Ihle, Karl-Heinz: *See*—
Neuman, Manfred; ZeiBig, Gerhard; Ihle, Karl-Heinz; Madler, Eckerhard; Schiller, Siegfried; and Schroller, Rudolf, 4,960,607, Cl. 427-8.000.
Iizuka, Shigeo; Kishi, Takao; Ogawa, Riichi; and Mizushima, Hiroshi, to Yoshino Kogyosho Co., Ltd. Makeup liquid container with applicator. 4,960,339, Cl. 401-129.000.
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Kato, Toshikiyo; Ichikawa, Yasuo; Ito, Wataru; Ikeda, Hiroshi; and Kamata, Yoshio, 4,960,337, Cl. 400-248.000.
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Ogino, Masanori; Yamada, Takeo; Ikeda, Miyuki; and Kimoto, Toshiyuki, 4,961,030, Cl. 315-368.000.
Ikeda, Osamu: *See*—
Takematsu, Tetsuo; Yoneyama, Kouichi; Jikihara, Tetsuo; Katsurada, Manabu; Shike, Toyohiko; Hosokawa, Akemi; Mikami, Emiko; and Ikeda, Osamu, 4,960,897, Cl. 546-346.000.
Ikeda, Sadao; and Taguchi, Yoshio, to Toyota Jidosha Kabushiki Kaisha. Method of manufacturing molded wooden product. 4,960,548, Cl. 264-40.400.
Ikegawa, Akihiko: *See*—
Okazaki, Masaki; Ikegawa, Akihiko; Yamada, Minoeu; and Steo, Kunio, 4,960,683, Cl. 430-428.000.
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Yamada, Hiroyuki; Takagiwa, Hiroyuki; Masaki, Hiroya; Kasuya, Takahira; Takahashi, Jiro; Uchida, Masafumi; and Ikeuchi, Satoru, 4,960,664, Cl. 430-109.000.
Imahori, Kazutomo; Kondo, Hitoshi; Nakajima, Hiroshi; and Iwasaki, Tatsuo, to Imahori, Kazutomo; Kenkyusho, Rikagaku; and Unitika Ltd. Process for producing physiolologically active substance by multienzyme process. 4,960,696, Cl. 435-42.000.
Imai, Chichiro: *See*—
Taguchi, Yoshio; Imai, Chichiro; and Imai, Yoshio, 4,960,903, Cl. 548-461.000.
Imai, Masafumi: *See*—
Murata, Masahide; Imai, Masafumi; Furuhashi, Hiroyuki; Maruyama, Kouji; and Ueno, Hiroshi, 4,960,743, Cl. 502-121.000.
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Taguchi, Yoshio; Imai, Chichiro; and Imai, Yoshio, 4,960,903, Cl. 548-461.000.
Imamura, Hitoshi: *See*—
Ichinose, Yusaku; and Imamura, Hitoshi, 4,960,485, Cl. 156-556.000.
Imamura, Tetsuo; Shirahata, Tatsuo; and Shoji, Kichiro, to Mitsui Petrochemical Industries, Ltd. Catalysts for catalytic pyrolysis of phenol distillation residue and process for recovering useful substances by pyrolysis the same. 4,960,958, Cl. 568-806.000.
Imaseki, Takashi, to Nissan Motor Company, Ltd. Device for controlling AC motor. 4,961,042, Cl. 318-758.000.
Imperial Chemical Industries plc: *See*—
Brierley, David; and Leaver, Alan T., 4,960,434, Cl. 8-524.000.
Staniland, Philip A., 4,960,851, Cl. 528-125.000.
Imura, Satoshi: *See*—
Tanaka, Takashi; Imura, Satoshi; and Kida, Yasuji, 4,960,678, Cl. 430-332.000.
Ina Bearing Company, Inc.: *See*—
Hodge, Bobby L., 4,960,193, Cl. 192-91.00A.
Inaba, Hidetoshi; Hasegawa, Hiroshi; and Kato, Hiroshi, to Hitachi, Ltd. Rotational angle control of screw tightening. 4,961,035, Cl. 318-600.000.
Inco Alloys International, Inc.: *See*—
Poole, Jon M.; and Curtis, Lindy J., 4,960,459, Cl. 419-63.000.
Inculet, Ion I.; and Lo, Kwan Y. Method for soil consolidation. 4,960,524, Cl. 210-747.000.
Indian Head Industries, Inc.: *See*—
Gummer, Allen L.; Choinski, Graydon J.; and Brooks, David W., 4,960,036, Cl. 92-63.000.
Industrie Zanussi SpA: *See*—
Rizzetto, Pietro, 4,960,139, Cl. 137-625.460.
Ingermann, Donald E.; Smith, Ronald L.; Caffrey, Stephen F.; and Steinhoff, Lonney J., to Century International Corporation. Combination bowling lane stripper and dressing apparatus. 4,959,884, Cl. 15-302.000.
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Albert, Gregory P., 4,960,373, Cl. 418-270.000.
Rice, Edwin E.; and Norris, Hugh R., 4,960,202, Cl. 198-781.000.
Ingolia, Thomas D.; Kaster, Kevin R.; and Rao, R. Nagaraja, to Eli Lilly and Company. Modified antibiotic resistance gene. 4,960,704, Cl. 435-252.330.
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Yamauchi, Kazumasa; Inoue, Hiromitsu; and Katayama, Susumu, 4,961,039, Cl. 340-554.000.
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Yamamoto, Taizo; and Inoue, Masakiyo, 4,959,943, Cl. 53-282.000.
Inoue, Takesi, to Mitsubishi Denki Kabushiki Kaisha. Noncontact type IC card and system for noncontact transfer of information using the same. 4,960,983, Cl. 235-449.000.
Inoue, Toshio: *See*—
Kawabata, Juheiji; Chiba, Manabu; Sugie, Toshinori; Kobata, Fumihiro; Izutsu, Hitoshi; Inoue, Toshio; and Mine, Takayuki, 4,960,841, Cl. 525-537.000.
Inoue, Yoshinori: *See*—
Kumanoya, Masaki; Konishi, Yasuhiro; Dosaka, Katsumi; Komatsu, Takahiro; and Inoue, Yoshinori, 4,961,167, Cl. 365-189.090.
Insite Peripherals: *See*—
Williams, Roger O.; Kurtz, Milton C.; Godwin, Jimmy D.; Williams, Stephen P.; and Roberts, Gregory K., 4,961,123, Cl. 360-131.000.
Insley, Harold, to Creative Capital Corp. Electrical resistance water heater effecting non-lamellar flow to avert cavitation therein. 4,960,976, Cl. 392-485.000.
Institut de Ercherches Chimiques et Biologiques Appliquees (I.R.-C.E.B.A.): *See*—
Danree, Bernard; Houziaux, Patrick; Lacolle, Jean-Yves; and Riffaud, Jean-Pierre, 4,960,900, Cl. 548-203.000.
Institut de Recherches de la Siderurgie Francaise: *See*—
Buffenoir, Marc; Pierret, Rene ; Hellegouarc'h, Jean; and Prost, Gerard, 4,960,967, Cl. 219-10.491.
Institut Francais du Petrole: *See*—
Marin, Eric; and Le Comte, Marcel, 4,960,181, Cl. 181-106.000.
Intec Laboratories: *See*—
Harris, Albert F., Jr., 4,960,279, Cl. 273-164.000.
Intel Corporation: *See*—
Tam, Simon M.; Holler, Mark A.; and Castro, Hernan A., 4,961,002, Cl. 307-201.000.
Intellitek, Inc.: *See*—
Schneider, Bruce H.; Schneider, Jerry S.; and Smith, Mark E., 4,961,149, Cl. 364-469.000.
International Healthcare Products, Inc.: *See*—
Frantz, Ronald F., 4,960,304, Cl. 297-284.000.
International Business Machines: *See*—
Debord, Pierre; and Glaise, Rene, 4,961,193, Cl. 371-37.200.

Nick, Howard H.; Osborn, Brock E.; and Wu, Chang Y., 4,961,157, Cl. 364-579.000.
International Business Machines Corporation: *See*—
Astheimer, Hans; Friedmann, Hans; and Schuy, Hubert, 4,961,121, Cl. 360-103.000.
Boyko, Christina M.; Johnston, Craig N.; Loomis, James R.; Samuelson, Carl E.; and Schumacher, Ricahrd A., 4,960,634, Cl. 428-220.000.
Crus, Richard A.; Haderle, Donald J.; and Teng, James Z., 4,961,134, Cl. 364-200.000.
Cukier, Maurice; Pilost, Daniel; and Rigal, Dominique, 4,961,189, Cl. 370-112.000.
Grimes, Dwight W., 4,961,192, Cl. 371-37.100.
Homola, Andrew M.; Lin, Li-Ju J.; and Saperstein, David D., 4,960,609, Cl. 427-38.000.
Hopkins, Martin E.; and Warren, Henry S., Jr., 4,961,141, Cl. 364-200.000.
Lechaton, John S.; and Schepis, Dominic J., 4,960,726, Cl. 437-59.000.
Nguyenphu, Myhong; and Thatcher, Larry E., 4,961,162, Cl. 364-748.000.
Pechanek, Gerald G.; Shippy, David J.; Snedaker, Mark C.; and Woodward, Sandra S., 4,961,140, Cl. 364-200.000.
Silvestri, Victor J.; and Tsang, Paul J., 4,960,717, Cl. 437-33.000.
Youlton, Henry G., 4,960,491, Cl. 156-668.000.
International Flavors & Fragrances Inc.: *See*—
Buckholz, Lawrence L., Jr.; Farbood, Mohamad I.; Kossiakoff, Nicolas; Scharpf, Lewis G.; and Seitz, Eugene W., 4,960,603, Cl. 426-536.000.
Farbood, Mohamad I.; Morris, James A.; Sprecker, Mark A.; Bienkowski, Lynda J.; Miller, Kevin P.; Vock, Manfred H.; and Hagedorn, Myrna L., 4,960,597, Cl. 426-3.000.
Wilson, Richard A.; Zampino, Michael J.; Mookherjee, Braja D.; Trenkle, Robert W.; Van Ouwerkerk, Anton; Hagedorn, Myrna L.; and Monteleone, Michael G., 4,960,754, Cl. 512-25.000.
International Paper Company: *See*—
Greenway, John M.; Schortmann, Walter E.; Mancini, Peter; Metrick, Dennis; and Connolly, Timothy, 4,960,630, Cl. 428-131.000.
Jeffers, Cecil W.; and Sewcyk, Richard, 4,959,894, Cl. 28-104.000.
International Tutor Machines, Limited: *See*—
Smith, Brian D.; Court, Nigel T.; and Howsam, Christopher G., 4,960,383, Cl. 434-430.000.
Intracel Corporation: *See*—
Siddiqi, Iqbal; and Mangan, Ciaron, 4,960,693, Cl. 435-7.000.
Inui, Kenichi: *See*—
Shimizu, Keiichi; Inui, Kenichi; and Aoike, Nanjou, 4,961,029, Cl. 315-219.000.
Irish, Ernest E. Harmonic optical oscillator. 4,961,119, Cl. 368-156.000.
Ishiguro, Akihiro: *See*—
Aida, Satoshi; Iwama, Nobuyuki; Suzuki, Syuzi; and Ishiguro, Akihiro, 4,960,107, Cl. 128-24.00A.
Ishii, Hideyuki: *See*—
Okabe, Kazuaki; Ishii, Hideyuki; Watanabe, Haruo; and Takeuchi, Shuichi, 4,960,849, Cl. 528-76.000.
Ishii, Kazuo: *See*—
Kato, Eiichi; and Ishii, Kazuo, 4,960,661, Cl. 430-49.000.
Ishii, Takaaki: *See*—
Marui, Kuniyoshi; Ishii, Takaaki; and Takahashi, Shinya, 4,961,212, Cl. 379-67.000.
Ishii, Yoshio: *See*—
Sakanoue, Kei; Ishii, Yoshio; and Hirano, Tsumoru, 4,960,688, Cl. 430-548.000.
Ishijima, Akira; Beppu, Toshihiko; and Kikuchi, Gunpei, to Ishijima Industrial Co., Ltd.; and Ebara Corporation. Washing arrangement for and method of washing lead frames. 4,960,140, Cl. 134-31.000.
Ishijima Industrial Co., Ltd.: *See*—
Ishijima, Akira; Beppu, Toshihiko; and Kikuchi, Gunpei, 4,960,140, Cl. 134-31.000.
Ishikawa, Hideyuki: *See*—
Tachibana, Fusao; Ishikawa, Hideyuki; and Suzuki, Kazuo, 4,960,097, Cl. 123-494.000.
Ishikawa, Norio: *See*—
Nakasa, Masayuki; Ishikawa, Norio; and Hosomizu, Hiroshi, 4,961,083, Cl. 354-145.100.
Ishikawa, Takatoshi; Fujimoto, Hiroshi; Yagihara, Morio; and Andoh, Kazuto, to Fuji Photo Film Co., Ltd. Method for processing silver halide color photographic materials. 4,960,684, Cl. 430-467.000.
Ishikawa Tekko Kabushiki Kaisha: *See*—
Aisa, Juazo; and Yamamoto, Mituo, 4,959,997, Cl. 73-308.000.
Ishikura, Hisatugu: *See*—
Abukawa, Toshimi; Okuyama, Toshiaki; Tahara, Kazuo; Marumoto, Katsuji; Koterazawa, Toshiyuki; Hombu, Mitsuyuki; Takahashi, Tadashi; Ishikura, Hisatugu; Yamamura, Hirohisa; Tatsuzaki, Toru; Omae, Tsutomu; and Takamatsu, Shuichi, 4,960,178, Cl. 180-79.100.
Ishino, Masato; and Sasai, Yoichi, to Matsushita Electric Industrial Co., Ltd. Semiconductor device. 4,961,198, Cl. 372-50.000.
Ishizaka, Hideo: *See*—
Matsuda, Shinichi; Saito, Yoshio; and Ishizaka, Hideo, 4,959,976, Cl. 62-271.000.
Isoi, Masaaki: *See*—
Komatsu, Masato; Isoi, Masaaki; Baba, Isao; and Mikami, Takashi, 4,960,823, Cl. 525-89.000.
Isotalo, Ilkka. Sampler for liquid substances. 4,960,002, Cl. 73-864.670.
Isoworth Limited: *See*—
Scott, Alistair; and Clark, Peter F., 4,960,261, Cl. 251-148.000.
Istituto di Ricerca Cesare Serono SpA: *See*—
Canosi, Umberto; De Fazio, Gabriele; and Villa, Stefano, 4,960,868, Cl. 530-389.000.
Istituto Nazionale Per Lo Studio E La Cura Dei Tumori: *See*—
Silvestrini, Rosella, 4,960,709, Cl. 436-64.000.
Ito, Noriki; Ogawara, Hiroshi; and Watanabe, Shunichi, to Yamanouchi Pharmaceutical Co., Ltd. Isoflavone derivatives, salts thereof, and oncostatic and immunosuppressive agents. 4,960,908, Cl. 549-403.000.
Ito, Wataru: *See*—
Kato, Toshikiyo; Ichikawa, Yasuo; Ito, Wataru; Ikeda, Hiroshi; and Kamata, Yoshio, 4,960,337, Cl. 400-248.000.
Itoh, Hisato; Oguchi, Takahisa; Enomoto, Katashi; Nakatsuka, Masakatsu; and Nishizawa, Tsutomu, to Mitsui Toatsu Chemicals, Inc; and Yamamoto Chemicals, Inc. 1,2-naphthalocyanine near-infrared absorbent and recording/display materials using same. 4,960,538, Cl. 252-299.200.
Itoh, Shigeki: *See*—
Miura, Satoshi; Nishimura, Masato; Itoh, Shigeki; and Asari, Takashi, 4,960,749, Cl. 503-213.000.
ITT Corporation: *See*—
Thomas, Nils I.; Tien, Albert F.; and Brown, Kenneth A., 4,961,025, Cl. 313-524.000.
Iwama, Nobuyuki: *See*—
Aida, Satoshi; Iwama, Nobuyuki; Suzuki, Syuzi; and Ishiguro, Akihiro, 4,960,107, Cl. 128-24.00A.
Iwamoto, Masayuki: *See*—
Yamaoki, Toshihiko; Wakisaka, Kenichiro; Minami, Kouji; and Iwamoto, Masayuki, 4,961,094, Cl. 355-326.000.
Iwamoto, Shoji, to Fuji Photo Film Co., Ltd. Method of and system for assembling magnetic disk cartridge. 4,960,480, Cl. 156-256.000.
Iwanaga, Naruyuki: *See*—
Harada, Isao; Yoda, Yukihiro; Iwanaga, Naruyuki; Nishitsuji, Toshihiko; and Kikkawa, Akio, 4,960,581, Cl. 423-489.000.
Iwasaki, Katsunori: *See*—
Nozawa, Yasuto; Tanigawa, Shigeho; and Iwasaki, Katsunori, 4,960,474, Cl. 148-302.000.
Tanigawa, Shigeho; Iwasaki, Katsunori; and Nozawa, Yasuto, 4,960,469, Cl. 148-105.000.
Iwasaki, Kazunori: *See*—
Toida, Shouji; Iwasaki, Kazunori; Goto, Toru; and Tsuchiya, Shigeru, 4,960,218, Cl. 215-311.000.
Iwasaki, Susumu; Kamisaka, Shigefumi; Yamazaki, Iwao; and Hatanaka, Tutomu, to Sakai Chemical Industry Co., Ltd. Process for producing microcrystalline Co/Ti-substituted barium ferrite platelets. 4,960,582, Cl. 423-632.000.
Iwasaki, Tatsuo: *See*—
Imahori, Kazutomo; Kondo, Hitoshi; Nakajima, Hiroshi; and Iwasaki, Tatsuo, 4,960,696, Cl. 435-42.000.
Izaki, Teruaki: *See*—
Wada, Toshiya; Tanaka, Osamu; Egawa, Takatoshi; Yoshida, Makato; Higuchi, Seizun; and Izaki, Teruaki, 4,960,652, Cl. 428-611.000.
Izatt, Reed M.: *See*—
Bradshaw, Jerald S.; Izatt, Reed M.; and Christensen, Virginia B., 4,960,882, Cl. 540-468.000.
Izutsu, Hitoshi: *See*—
Kawabata, Juheiji; Chiba, Manabu; Sugie, Toshinori; Kobata, Fumihiro; Izutsu, Hitoshi; Inoue, Toshio; and Mine, Takayuki, 4,960,841, Cl. 525-537.000.
J.M. Voith GmbH: *See*—
Weitzel, Wolfgang; and Egelhof, Dieter, 4,960,492, Cl. 162-301.000.
Jablin, Richard. Coke oven hood apparatus. 4,960,199, Cl. 202-263.000.
Jaeckel, Lothar: *See*—
Wehowsky, Frank; Kleber, Rolf; and Jaeckel, Lothar, 4,960,543, Cl. 560-26.000.
Jaffari, Cyrus: *See*—
Doble, Florimel; Gallego, Jose M.; Steidl, El; and Jaffari, Cyrus, 4,960,511, Cl. 210-96.100.
Jager, Gerhard: *See*—
Holmwood, Graham; Jager, Gerhard; Buchel, Karl H.; Brandes, Wilhelm; Dutzmann, Stefan; and Hanssler, Gerd, 4,960,453, Cl. 71-92.000.
Holmwood, Graham; Regel, Erik; Jager, Gerhard; Buchel, Karl H.; Lurssen, Klaus; Frohberger, Paul-Ernst; Brandes, Wilhelm; and Paul, Volker, 4,960,456, Cl. 71-92.000.
Jaguar Cars Limited: *See*—
Sadler, Stephen J., 4,960,292, Cl. 280-731.000.
Jakobson, Gerald; and Siemanowski, Werner, to Deutsche Solvay-Werke GmbH. Process for preparing polyglycerols. 4,960,953, Cl. 568-621.000.
James, Keith: *See*—
Danilewicz, John C.; and James, Keith, 4,960,792, Cl. 514-481.000.
James River Corporation: *See*—
Swiontek, Anthony J., 4,960,598, Cl. 426-107.000.
Jamzadeh, Fereidoon S., to Eastman Kodak Company. Method and apparatus for web tracking with predictive control. 4,961,089, Cl. 355-207.000.
Janai, Meir I.: *See*—
Orbach, Zvi; and Janai, Meir I., 4,960,729, Cl. 437-101.000.
Janisch, Andreas: *See*—
Stritzl, Karl; Hoffmann, Kurt; Freisinger, Henry; Janisch, Andreas; Brunnhuber, Egon; Zotter, Johann; Spitaler, Egelbert; Wladar, Helmut; Muhlberger, Reinhard; and Dapeci, Karl, 4,960,289, Cl. 280-630.000.

Jannemann, Theo; and Berg, Hans, to Ruhrgas Aktiengesellschaft. Gas burner. 4,960,378, Cl. 431-114.000.

Janome Sewing Machine Co. Ltd.: *See*—
Hanyu, Susumu; Kasuga, Noboru; Hara, Kazumasa; Koike, Mikio; and Ninijima, Mitsuru, 4,960,062, Cl. 112-255.000.

Janome Sewing Machine Industry Co., Ltd.: *See*—
Orii, Akira; and Morita, Hiroyuki, 4,961,037, Cl. 318-696.000.

Jarboe, Enos D.; Jarboe, Rodney D.; and Barclay, Edward M., to Futura Coatings, Inc. Artificial urethane rock. 4,960,622, Cl. 428-15.000.

Jarboe, Rodney D.: *See*—
Jarboe, Enos D.; Jarboe, Rodney D.; and Barclay, Edward M., 4,960,622, Cl. 428-15.000.

Jarett, Keith: *See*—
Elliott, John C.; O'Connell, James A.; Ladouceur, Lawrence; Altman, William; and Jarett, Keith, 4,961,142, Cl. 364-408.000.

Jarmon, David C.; and Prewo, Karl M., to United Technologies Corporation. Fiber reinforced composite article. 4,960,629, Cl. 428-113.000.

Jarrold, Gregory S.: *See*—
Bryan, Philip S.; Lambert, Patrick M.; Towers, Christine M.; and Jarrold, Gregory S., 4,961,004, Cl. 250-483.100.

Jean Walterscheid GmbH: *See*—
Geisthoff, Hubert; and Kampf, Klaus, 4,960,344, Cl. 403-316.000.

Jeffers, Cecil W.; and Sewcyk, Richard, to International Paper Company. Disposable semi-durable nonwoven fabric and related method of manufacture. 4,959,894, Cl. 28-104.000.

Jelich, Klaus; Babczinski, Peter; Santel, Hans-Joachim; Schmidt, Robert R.; and Strang, Harry, to Bayer Aktiengesellschaft. Herbicidal triazolodihydropyrimidine-2-sulphonamides. 4,960,455, Cl. 71-92.000.

Jelinek, Istvan: *See*—
Szalay, Erzsebet; Lugosi, Gyorgy; Kallay, Tamas U.; Nad, Zsuzsanna; Jelinek, Istvan; Simonidesz, Vilmos; Gyory, Peter; Nagy, Lajos; Lugosi, Marta; Santa nee Singola, Ilona; Besenyei, Gabor; and Simandi, Laszlo , 4,960,913, Cl. 552-206.000.

Jessop, Thomas C., to Eastman Kodak Company. Lens adjustment apparatus. 4,961,115, Cl. 358-229.000.

Jidosha Kiki Co., Ltd.: *See*—
Yabe, Hideo; and Hori, Hideo, 4,961,144, Cl. 364-424.050.

Jikihara, Tetsuo: *See*—
Takematsu, Tetsuo; Yoneyama, Kouichi; Jikihara, Tetsuo; Katsurada, Manabu; Shike, Toyohiko; Hosokawa, Akemi; Mikami, Emiko; and Ikeda, Osamu, 4,960,897, Cl. 546-346.000.

Jin, Sungho: *See*—
Dentini, Mark S.; Fulton, Joe A.; Jin, Sungho; Mottine, John J., Jr.; Shepherd, Lloyd; and Sherwood, Richard C., 4,960,612, Cl. 427-47.000.

JL Forklift Truck A/S: *See*—
Laursen, Jens, 4,960,357, Cl. 414-667.000.

Johal, Sajit S.; and Cash, Howard S., to Standard Oil Company, The. Recovery of polysaccharides by employing a divalent cation with a water miscible organic solvent. 4,960,697, Cl. 435-101.000.

Johann, Peter; and Winkler, Georg, to Rohm GmbH Chemische Fabrik. Process for the filtration of thickened corn gluten. 4,960,705, Cl. 435-272.000.

Johannes, Wayne N., to Vac-Puff Corporation. System for packaging a product and forewarning consumers if the package has been tampered with. 4,960,206, Cl. 206-459.000.

Johansson, Hans V.; and Rydin, Arne O. T., to Telefonaktiebolaget L M Ericsson. Apparatus in a telecommunication system for supplying power to a telephone set. 4,961,222, Cl. 379-413.000.

Johnson, Ivy D., to Mobil Oil Corporation. Layered aluminum compounds containing phosphorus or arsenic and pendant organic groups. 4,960,745, Cl. 502-150.000.

Johnson Matthey Inc.: *See*—
Grundy, James, 4,960,647, Cl. 428-472.100.

Johnston, Craig N.: *See*—
Boyko, Christina M.; Johnston, Craig N.; Loomis, James R.; Samuelson, Carl E.; and Schumacher, Ricahrd A., 4,960,634, Cl. 428-220.000.

Johnston Service Company: *See*—
Fudim, Efrem V.; and Colla, Jeannine O., 4,960,674, Cl. 430-284.000.

Joint Medical Products Corporation: *See*—
Noiles, Douglas G., 4,960,427, Cl. 623-22.000.

Joka Kathetertechnik GmbH: *See*—
Sunnanvader, Lars; and Hartig, Tomas, 4,960,259, Cl. 251-7.000.

Joly, Jean C.: *See*—
Canonge, Michel; and Joly, Jean C., 4,960,927, Cl. 560-234.000.

Jones, Keith E.: *See*—
Harwood, Warren K.; Jones, Keith E.; and DeLessert, Daniel, 4,961,050, Cl. 324-158.00F.

Jones, Michael L.: *See*—
Roush, David M.; Shaw, Donald A.; Jones, Michael L.; and Chang, Jun H., 4,960,884, Cl. 514-721.000.

Jones, Robert: *See*—
Henderson, Andrew R.; and Jones, Robert, 4,961,080, Cl. 346-108.000.

Jordan, William D.; and Clemens, Donald L., to Thermalloy Incorporated. Apparatus and method of attaching an electronic device package and a heat sink to a circuit board. 4,961,125, Cl. 361-383.000.

Jordan, Willie W.; and McGraw, Brian J., to Abbott Laboratories. Snap cap. 4,960,219, Cl. 215-354.000.

Juki Corporation: *See*—
Shiga, Norio, 4,961,081, Cl. 346-140.00R.

Junghans, Rudi, to Heidelberger Druckmaschinen Aktiengesellschaft. Film inking apparatus for a printing press. 4,960,052, Cl. 101-350.000.

Junginger, Erich; Schnaibel, Eberhard; and Schneider, Erich, to Robert Bosch GmbH. Device for signalling faulty conditions in motor vehicle. 4,960,087, Cl. 123-198.00D.

Junino, Alex; Vandenbossche, Jean J.; Borowiak, Herve; and Lang, Gerard, to L'Oreal. Meta-phenylenediamines, process for preparation thereof, intermediate compounds and use of these meta-phenylenediamines as couplers for the oxidation dyeing of keratinous fibres and especially human hair. 4,960,432, Cl. 8-411.000.

Junkeris, Edmund. Water ski tow rope apparatus. 4,960,065, Cl. 114-254.000.

Jurkovich, Maria Escery nee, Zoltan Jossef Escery, heirs: *See*—
Ecsery, Zoltan, deceased; Knoll, Jozsef; Somfai, Eva; Torok, Zoltan; Szinnyei, Eva; and Mozsolics, Karoly, 4,960,797, Cl. 514-654.000.

Kabushiki Kaisha Fuji Iryoki: *See*—
Yamasaki, Yoshikiyo, 4,960,110, Cl. 128-52.000.

Kabushiki Kaisha Japan Health: *See*—
Yamasaki, Yoshikiyo, 4,960,110, Cl. 128-52.000.

Kabushiki Kaisha Kobe Seiko Sho: *See*—
Takata, Susumu; and Murahashi, Mamoru, 4,960,649, Cl. 428-574.000.

Kabushiki Kaisha SAKURAKUREPASU: *See*—
Tamiya, Fumiyuki; Kobayashi, Nobuaki; and Fukuoka, Mitsuhiro, 4,960,340, Cl. 401-186.000.

Kabushiki Kaisha Tokyo Kikai Seisakusho: *See*—
Ohta, Hideo; and Kobayashi, Haruyoshi, 4,960,051, Cl. 101-349.000.

Kabushiki Kaisha Topcon: *See*—
Sekine, Ahihiko, 4,960,327, Cl. 351-221.000.

Kabushiki Kaisha Toshiba: *See*—
Aida, Satoshi; Iwama, Nobuyuki; Suzuki, Syuzi; and Ishiguro, Akihiro, 4,960,107, Cl. 128-24.00A.
Ashida, Kazuhide, 4,961,131, Cl. 364-140.000.
Marui, Kuniyoshi; Ishii, Takaaki; and Takahashi, Shinya, 4,961,212, Cl. 379-67.000.
Noguchi, Tatsuo, 4,960,725, Cl. 437-57.000.
Okamoto, Hiroshi; Fushimi, Kimio; Mochizuki, Satoru; and Ootuka, Yoshio, 4,959,969, Cl. 62-157.000.
Sagou, Seiji, 4,960,659, Cl. 430-23.000.
Sato, Kazuyuki, 4,961,136, Cl. 364-200.000.
Takahashi, Naomasa, 4,960,321, Cl. 350-255.000.
Terashima, Kazutaka; Kawachi, Masaru; and Yoshida, Hircaki, 4,960,721, Cl. 437-247.000.
Uchihori, Ikuo, 4,961,135, Cl. 364-200.000.
Uehara, Kensuke, 4,961,177, Cl. 367-197.000.
Yano, Masahiko, 4,959,998, Cl. 73-626.000.

Kabushiki Kaisha Toyota Chuo Kenkyusho: *See*—
Ozeki, Osamu; Higuchi, Kazunori; and Yamamoto, Shin, 4,961,155, Cl. 364-559.000.

Kagawa, Nobuaki: *See*—
Kawashima, Yasuhiko; Tanaka, Shinri; Kojima, Tamotsu; and Kagawa, Nobuaki, 4,960,686, Cl. 430-522.000.

Kageyama, Keisuke, to Sumitomo Special Metal Co., Ltd. Method for producing a material for use in a microwave dielectric resonator. 4,960,739, Cl. 501-137.000.

Kaieda, Shozo, to Kentek Information Systems, Inc. Magnetic brush developing device. 4,960,069, Cl. 118-657.000.

Kajima Corporation: *See*—
Yamada, Toshikazu; Kobori, Takuji; Sakamoto, Mitsuo; Maeda, Shozo; and Takahashi, Shinichi, 4,959,934, Cl. 52-167.00R.

Kajimura, Takashi: *See*—
Tanaka, Toshiaki; Kajimura, Takashi; Kawano, Toshihiro; and Ono, Yuichi, 4,961,197, Cl. 372-45.000.

Kajiwara, Yasuya, to Mitsubishi Denki Kabushiki Kaisha. Automobile speed control apparatus with creep control. 4,961,146, Cl. 364-426.040.

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Kakino, Yoshiaki; Ihara, Yukitoshi; Yonetani, Mitsuo; and Teshima, Takeo, to Kakino, Yoshiaki; Ihara, Yukitoshi; and Mitsubishi Denki Kabushiki Kaisha. Numerical control device. 4,961,034, Cl. 318-600.000.

Kakinoki, Wataru; Miyoshi, Noriaki; and Arai, Koji, to Akai Electric Co., Ltd. Stator for use in a brushless motor. 4,961,017, Cl. 310-71.000.

Kakushima, Masatoshi: *See*—
Nishio, Maki; Kakushima, Masatoshi; Konishi, Masataka; and Oki, Toshikazu, 4,960,755, Cl. 514-8.000.

Kalaam, Shaik M.; and Hughson, Gary W., to Safeco Mfg. Limited. Fireman's coat. 4,959,876, Cl. 2-93.000.

Kalazny, Andrzej J., to Dana Corporation. Adjustable height article supporting mechanism. 4,960,203, Cl. 198-802.000.

Kallay, Tamas U.: *See*—
Szalay, Erzsebet; Lugosi, Gyorgy; Kallay, Tamas U.; Nad, Zsuzsanna; Jelinek, Istvan; Simonidesz, Vilmos; Gyory, Peter; Nagy, Lajos; Lugosi, Marta; Santa nee Singola, Ilona; Besenyei, Gabor; and Simandi, Laszlo , 4,960,913, Cl. 552-206.000.

Kallin, Fredrik L. N.: *See*—
Brooks, Ralf M.; Kallin, Fredrik L. N.; Marshall, Gary R.; and Reid, Bruce A., 4,960,336, Cl. 400-61.000.

Kamata, Kazuo: *See*—
Komatsuzaki, Hiroshi; Kamata, Kazuo; Ohmiya, Akio; Nishimura, Syunji; Umeda, Yoshihito; Mochizuki, Noriya; and Furuya, Eiji, 4,961,084, Cl. 354-268.000.

Kamata, Susumu: *See—*
Narisada, Masayuki; Ohtani, Mitsuaki; Watanabe, Fumihiko; Hagishita, Sanji; Seno, Kaoru; Kamata, Susumu; Haga, Nobuhiro; Tsuri, Tatsuo; Tsushima, Tadahiko; and Kawada, Kenji, 4,960,909, Cl. 549-463.000.

Kamata, Yoshio: *See—*
Kato, Toshikiyo; Ichikawa, Yasuo; Ito, Wataru; Ikeda, Hiroshi; and Kamata, Yoshio, 4,960,337, Cl. 400-248.000.

Kamel, Ihab L.: *See—*
Reilly, John J.; and Kamel, Ihab L., 4,960,818, Cl. 524-440.000.

Kamihara, Tetuya: *See—*
Kono, Michikata; Wada, Yoshiyuki; Kamihara, Tetuya; Tatematsu, Masahito; and Suda, Koichi, 4,960,089, Cl. 123-260.000.

Kaminski, Frank; and Schiffhauer, Earl J., to Eastman Kodak Company. System for storing a hazardous liquid. 4,960,151, Cl. 137-376.000.

Kamio, Kunimasa: *See—*
Saito, Yasuhisa; Kamio, Kunimasa; Shibata, Mitsuhiro; Watanabe, Katsuya; Shiomi, Yutaka; and Ueda, Youichi, 4,960,860, Cl. 528-353.000.

Kamir, Josef: *See—*
Pomerantz, Itzchak; Cohen-Sabban, Joseph; Bieber, Avigdor; Kamir, Josef; Katz, Mathew; and Nagler, Michael, 4,961,154, Cl. 364-522.000.

Kamisaka, Shigefumi: *See—*
Iwasaki, Susumu; Kamisaka, Shigefumi; Yamazaki, Iwao; and Hatanaka, Tutomu, 4,960,582, Cl. 423-632.000.

Kamoshita, Yasuo: *See—*
Yoshitomi, Toshihiko; Yushina, Heihachi; Horiuchi, Hiromi; Yamaguchi, Yukio; Kamoshita, Yasuo; and Sekihara, Kiyoshi, 4,960,668, Cl. 430-122.000.

Kampf, Klaus: *See—*
Geisthoff, Hubert; and Kampf, Klaus, 4,960,344, Cl. 403-316.000.

Kanai, Takao; Tanemoto, Kei; Kubo, Hiroshi; and Sato, Toyohiko, to Nippon Steel Corporation. Ceramic composite and process for preparation thereof. 4,960,734, Cl. 501-98.000.

Kanamaru, Hitoshi; and Watanabe, Tsuyoshi, to Pioneer Electronic Corporation. Method of, and apparatus for, facilitating sychronization of recorded audio and video information. 4,961,116, Cl. 358-343.000.

Kanehara, Koichi; and Fukuda, Kazumi, to Mitsubishi Jukogyo Kabushiki Kaisha. Automatic toll collector. 4,960,196, Cl. 194-215.000.

Kanekiyo, Takazumi, to Mitsubishi Petrochemical Co., Ltd. Aqueous liquid detergents containing an N-acyl-aspartate, amine oxide and alkyl ether sulfate. 4,960,541, Cl. 252-546.000.

Kaneko, Hiroshi: *See—*
Yazawa, Masahiko; Kaneko, Hiroshi; and Takemoto, Katsuo, 4,960,843, Cl. 526-262.000.

Kaneko, Takashi: *See—*
Satake, Yoshikatsu; Yamamoto, Shinji; Kaneko, Takashi; Tada, Masahito; Kashiwadate, Ken; Mizuno, Toshiya; Endo, Hiroyuki; Katto, Takayuki; and Shiiki, Zenya, 4,960,555, Cl. 264-288.400.
Satake, Yoshikatsu; Yamamoto, Shinji; Kaneko, Takashi; Tada, Masahito; Kashiwadate, Ken; Mizuno, Toshiya; Endo, Hiroyuki; Katto, Takayuki; and Shiiki, Zenya, 4,960,806, Cl. 524-100.000.

Kanno, Ryuta: *See—*
Chihara, Shuichi; Kanno, Ryuta; and Okuma, Akitoshi, 4,960,256, Cl. 248-284.000.

Kansai Paint Company, Limited: *See—*
Fujisawa, Atsuhisa; Ojima, Masuo; Wakabayashi, Kenji; Omoto, Souji; and Shimizu, Toyokazu, 4,960,611, Cl. 427-43.100.
Higuchi, Tetsuo; Yamaguchi, Sachio; Sugimura, You; Sugiura, Shinji; and Nakamura, Shigeru, 4,960,828, Cl. 525-162.000.

Kanto Kasei Co., Ltd.: *See—*
Yokoi, Hiroshi, 4,960,653, Cl. 428-613.000.

Kanzaki Paper Manufacturing Co., Ltd.: *See—*
Mukoyoshi, Shunichiro; Yamori, Tsunefumi; Shuku, Shigekazu; and Fujioka, Hironari, 4,960,638, Cl. 428-342.000.

Kanzaki, Shigeru: *See—*
Kinoshita, Tatsuo; Minami, Shuji; and Kanzaki, Shigeru, 4,960,875, Cl. 585-10.000.

Kapples, Kevin J.: *See—*
Shutske, Gregory M.; and Kapples, Kevin J., 4,960,767, Cl. 514-211.000.

Karakida, Ken-ichi: *See—*
Nishikawa, Masayuki; Komori, Yumiko; Yokoi, Masaki; Ono, Masato; Takahashi, Noriyoshi; Fukuda, Yuzuru; Yagi, Shigeru; and Karakida, Ken-ichi, 4,960,662, Cl. 430-64.000.

Karasek, Donald F.: *See—*
Aiello, Salvatore F.; Brown, Jeffrey K.; Karasek, Donald F.; Lazzeroni, Edward J., Sr.; Lazzeroni, Edward J., Jr.; Quella, John F.; and Zollers, Timothy E., 4,959,923, Cl. 43-112.000.

Karpisek, Ladislav S. Pallet dispenser. 4,960,362, Cl. 414-797.400.

Kasahara, Toshiro. Filter circuit utilizing reversible counter for generating a satisfactory hysteresis. 4,961,014, Cl. 307-520.000.

Kashiwadate, Ken: *See—*
Satake, Yoshikatsu; Yamamoto, Shinji; Kaneko, Takashi; Tada, Masahito; Kashiwadate, Ken; Mizuno, Toshiya; Endo, Hiroyuki; Katto, Takayuki; and Shiiki, Zenya, 4,960,555, Cl. 264-288.400.
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Kashiwase, Hajime, to Fuji Jukogyo Kabushiki Kaisha. Automatic transmission for a motor vehicle. 4,960,005, Cl. 74-329.000.

Kaster, Kevin R.: *See—*
Ingolia, Thomas D.; Kaster, Kevin R.; and Rao, R. Nagaraja, 4,960,704, Cl. 435-252.330.

Kasuga, Noboru: *See—*
Hanyu, Susumu; Kasuga, Noboru; Hara, Kazumasa; Koike, Mikio; and Ninijima, Mitsuru, 4,960,062, Cl. 112-255.000.

Kasuga, Toshihiro; Yoshida, Masahiro; Uno, Tomoko; and Nakajima, Kiichi, to Hoya Corporation. Inorganic biomaterial and process for producing the same. 4,960,733, Cl. 501-10.000.

Kasuya, Michio; and Tomoda, Akihiro, to Canon Kabushiki Kaisha. Sheet receiving device. 4,961,091, Cl. 355-321.000.

Kasuya, Takahira: *See—*
Yamada, Hiroyuki; Takagiwa, Hiroyuki; Masaki, Hiroya; Kasuya, Takahira; Takahashi, Jiro; Uchida, Masafumi; and Ikeuchi, Satoru, 4,960,664, Cl. 430-109.000.

Katagiri, Yoshihiro: *See—*
Okuda, Akihito; Katagiri, Yoshihiro; and Aoki, Hiromi, 4,959,959, Cl. 60-489.000.

Katayama, Eiichi; Ueda, Kouichi; Takebayashi, Hiroaki; and Rokkaku, Kazuo, to Koyo Seiko Co., Ltd.; and Showa Tool Co., Ltd. Traction drive spindle device. 4,960,405, Cl. 475-183.000.

Katayama, Kazuyori: *See—*
Mimura, Munehiko; Tatumi, Takumi; Naito, Yasuo; and Katayama, Kazuyori, 4,960,182, Cl. 180-179.000.

Katayama, Susumu: *See—*
Yamauchi, Kazumasa; Inoue, Hiromitsu; and Katayama, Susumu, 4,961,039, Cl. 340-554.000.

Kato, Eiichi; and Ishii, Kazuo, to Fuji Photo Film Co., Ltd. Electrophotographic lithographic printing plate precursor. 4,960,661, Cl. 430-49.000.

Kato, Hiroshi: *See—*
Inaba, Hidetoshi; Hasegawa, Hiroshi; and Kato, Hiroshi, 4,961,035, Cl. 318-600.000.

Kato, Hisaaki; Yamaguchi, Hiroshi; Mori, Hideshi; and Shimano, Akira, to Murata Kikai Kabushiki Kaisha. Operation starting method for spinning machine. 4,959,952, Cl. 57-261.000.

Kato, Kanami: *See—*
Kusakabe, Kouichi; Hayasaka, Ryozo; and Kato, Kanami, 4,960,968, Cl. 219-78.010.

Kato, Kuniki; Takita, Tomohisa; Nishiyama, Shigeru; and Yamamura, Shosuke, to Nippon Kayaku Kabushiki Kaisha. Oxetane derivatives. 4,960,910, Cl. 549-510.000.

Kato, Toshikiyo; Ichikawa, Yasuo; Ito, Wataru; Ikeda, Hiroshi; and Kamata, Yoshio, to Citizen Watch Co., Ltd. Ribbon mask for a printer. 4,960,337, Cl. 400-248.000.

Katoh, Chieji: *See—*
Fujiwara, Toshiaki; and Katoh, Chieji, 4,961,008, Cl. 307-296.300.

Katoh, Kazunobu: *See—*
Okada, Hisashi; and Katoh, Kazunobu, 4,960,672, Cl. 430-264.000.

Katsurada, Manabu: *See—*
Takematsu, Tetsuo; Yoneyama, Kouichi; Jikihara, Tetsuo; Katsurada, Manabu; Shike, Toyohiko; Hosokawa, Akemi; Mikami, Emiko; and Ikeda, Osamu, 4,960,897, Cl. 546-346.000.

Katsuragawa, Tadao: *See—*
Ohta, Wasaburo; Kinoshita, Mikio; and Katsuragawa, Tadao, 4,960,072, Cl. 112-723.000.

Katto, Takayuki: *See—*
Satake, Yoshikatsu; Yamamoto, Shinji; Kaneko, Takashi; Tada, Masahito; Kashiwadate, Ken; Mizuno, Toshiya; Endo, Hiroyuki; Katto, Takayuki; and Shiiki, Zenya, 4,960,555, Cl. 264-288.400.
Satake, Yoshikatsu; Yamamoto, Shinji; Kaneko, Takashi; Tada, Masahito; Kashiwadate, Ken; Mizuno, Toshiya; Endo, Hiroyuki; Katto, Takayuki; and Shiiki, Zenya, 4,960,806, Cl. 524-100.000.

Katz, Mathew: *See—*
Pomerantz, Itzchak; Cohen-Sabban, Joseph; Bieber, Avigdor; Kamir, Josef; Katz, Mathew; and Nagler, Michael, 4,961,154, Cl. 364-522.000.

Kaufman, William H.; Gidman, Claude J.; Harrison, Frederick A.; and Beekenkamp, Gerald, to William H. Kaufman Inc. Downhill ski boot assembly. 4,959,912, Cl. 36-117.000.

Kauschke, Hans-Dieter: *See—*
Schwarz, Dieter; and Kauschke, Hans-Dieter, 4,961,180, Cl. 370-110.100.

Kauss, Wolfgang, to Mannesmann Rexroth GmbH. Control system for a hydraulic lift driven by a variable displacement pump. 4,960,035, Cl. 91-445.000.

Kawabata, Juheiji; Chiba, Manabu; Sugie, Toshinori; Kobata, Fumihiro; Izutsu, Hitoshi; Inoue, Toshio; and Mine, Takayuki, to Dainippon Ink and Chemicals, Inc. Polyphenylene sulfide/polyphenylene sulfide sulfone block copolymer. 4,960,841, Cl. 525-537.000.

Kawabata, Juheiji: *See—*
Kotera, Kohichi; Sugie, Toshinori; Kobata, Fumihiro; Kawabata, Juheiji; and Hasegawa, Sugio, 4,960,861, Cl. 528-388.000.

Kawabata, Kohji: *See—*
Takaya, Takao; Sakane, Kazuo; Miyai, Kenzi; and Kawabata, Kohji, 4,960,766, Cl. 514-202.000.
Takaya, Takao; Takasugi, Hisashi; Masugi, Takashi; Yamanaka, Hideaki; and Kawabata, Kohji, 4,960,889, Cl. 544-329.000.

Kawabuchi, Masami: *See—*
Tanaka, Hideyuki; Saito, Koetsu; Sakai, Ikuo; and Kawabuchi, Masami, 4,961,176, Cl. 367-155.000.

Kawachi, Masaru: *See—*
Terashima, Kazutaka; Kawachi, Masaru; and Yoshida, Hiroaki, 4,960,721, Cl. 437-247.000.

Kawada, Kenji: *See*—
Narisada, Masayuki; Ohtani, Mitsuaki; Watanabe, Fumihiko; Hagishita, Sanji; Seno, Kaoru; Kamata, Susumu; Haga, Nobuhiro; Tsuri, Tatsuo; Tsushima, Tadahiko; and Kawada, Kenji, 4,960,909, Cl. 549-463.000.

Kawahara, Midori: *See*—
Eonomoto, Takamitsu; Ueda, Hiroshi; Kawahara, Midori; Okada, Naoki; and Murata, Noboru, 4,960,551, Cl. 264-65.000.

Kawakami, Kazuhiko: *See*—
Shimada, Junichi; Kobayashi, Kazutoshi; Moriyama, Norio; and Kawakami, Kazuhiko, 4,960,099, Cl. 123-647.000.

Kawakami, Kenji: *See*—
Mototake, Tatsuya; Outou, Tatsuyuki; Yamamoto, Yoshinori; and Kawakami, Kenji, 4,961,120, Cl. 360-85.000.

Kawakami, Kouji: *See*—
Aoki, Toyoaki; Kawakami, Kouji; Tanaka, Yoshiharu; and Hoshikawa, Hiroshi, 4,960,711, Cl. 436-124.000.

Kawanabe, Tasuku, to Brother Kogyo Kabushiki Kaisha. Wire EDM with apparatus supporting a workpiece through wall of machining bath. 4,960,971, Cl. 219-69.120.

Kawano, Toshihiro: *See*—
Tanaka, Toshiaki; Kajimura, Takashi; Kawano, Toshihiro; and Ono, Yuichi, 4,961,197, Cl. 372-45.000.

Kawasaki, Hirozi: *See*—
Sageshima, Akira; Ozaki, Tadashi; Kawasaki, Hirozi; and Masuda, Isao, 4,960,194, Cl. 192-103.00B.

Kawashima, Yasuhiko; Tanaka, Shinri; Kojima, Tamotsu; and Kagawa, Nobuaki, to Konica Corporation. Silver halide photographic light-sensitive material containing oxonol dye. 4,960,686, Cl. 430-522.000.

Kawashima, Yoshiro: *See*—
Nakamura, Koutaro; and Kawashima, Yoshiro, 4,960,670, Cl. 430-138.000.

Keller, Andreas. Process for performing a dialysis operation using a magnetic weighted clamp. 4,960,521, Cl. 210-644.000.

Kellerwessel, Hans: *See*—
Esna-Ashari, Mohammed; Kellerwessel, Hans; Gemmer, Ludwig; and Hamacher, Gert-Helge, 4,960,461, Cl. 423-27.000.

Kelley, Roy C. Extension handle for wrenches. 4,960,014, Cl. 81-177.200.

Kelly, James B.: *See*—
Patterson, Gregory S.; and Kelly, James B., 4,959,955, Cl. 60-204.000.

Kemp, Richard A., to Shell Oil Company. Alkoxylation process catalyzed by lanthanum silicates and metasilicates. 4,960,952, Cl. 568-618.000.

Kendall, James M., Jr.; Wang, Taylor G.; and Elleman, Daniel D., to California Institute of Technology. Shell forming system. 4,960,351, Cl. 425-6.000.

Kenkyusho, Rikagaku: *See*—
Imahori, Kazutomo; Kondo, Hitoshi; Nakajima, Hiroshi; and Iwasaki, Tatsuo, 4,960,696, Cl. 435-42.000.

Kennametal Inc.: *See*—
Mehrotra, Pankaj K.; and Billman, Elizabeth R., 4,960,735, Cl. 501-89.000.

Kennedy, Lawrence C.: *See*—
Lambert, Harvey J.; and Kennedy, Lawrence C., 4,960,191, Cl. 192-58.00B.

Kentek Information Systems, Inc.: *See*—
Kaieda, Shozo, 4,960,069, Cl. 118-657.000.

Kerschmann, Russell L. Image recording apparatus. 4,960,330, Cl. 356-36.000.

Kessler, Bernd: *See*—
Koerber, Heinz; Hanke, Rudolf; Paessler, Helmar; Kessler, Bernd; Raetzsch, Manfred; Heger, Adolf; and Kolletzky, Karlheinz, 4,960,430, Cl. 8-114.000.

Kester, Jeffrey J.; Bernhardt, Christian A.; Elsen, Joseph J.; Letton, James A.; and Fox, Mary M., to Procter & Gamble Co., The. Polyol polyesters as a protective moisture barrier for foods. 4,960,600, Cl. 426-310.000.

Key-Tech, Inc.: *See*—
Durand, David, 4,960,614, Cl. 427-54.100.

Khoshnevisan, Mohsen; and Yeh, Pochi A., to Rockwell International Corporation. Kerr-Bragg agile beam steering device. 4,960,322, Cl. 350-354.000.

Kicherer, Robert: *See*—
Lorenz, Josef; and Kicherer, Robert, 4,960,978, Cl. 219-455.000.

Kida, Yasuji: *See*—
Tanaka, Takashi; Imura, Satoshi; and Kida, Yasuji, 4,960,678, Cl. 430-332.000.

Kienhofer, Gerhard, to Gerhard D. Wempe KG, Firma. Arm band. 4,960,232, Cl. 224-179.000.

Kikkawa, Akio: *See*—
Harada, Isao; Yoda, Yukihiro; Iwanaga, Naruyuki; Nishitsuji, Toshihiko; and Kikkawa, Akio, 4,960,581, Cl. 423-489.000.

Kiko, Frederick J., to Tollgrade Communications, Inc. Enhanced line powered amplifier. 4,961,218, Cl. 379-347.000.

Kikuchi, Gunpei: *See*—
Ishijima, Akira; Beppu, Toshihiko; and Kikuchi, Gunpei, 4,960,140, Cl. 134-31.000.

Kikuchi, Hiroshi: *See*—
Hirota, Sadao; Kikuchi, Hiroshi; Yamauchi, Hitoshi; and Tomikawa, Munehiro, 4,960,595, Cl. 424-450.000.

Kim, Dong K.; and Shemenski, Robert M., to Goodyear Tire & Rubber Company, The. Process for manufacturing steel filament. 4,960,473, Cl. 148-12.00B.

Kim, Jong S.; Han, Min S.; Lim, Bun S.; Lee, Gae C.; and Lee, Seung T., to Miwon Co., Ltd. Process for purification and recovery of L-phenylalanine. 4,960,930, Cl. 562-443.000.

Kim, Won-Tae, to Goldstar Co., Ltd. Cathode-ray tube socket. 4,960,385, Cl. 439-182.000.

Kimoto, Toshiyuki: *See*—
Ogino, Masanori; Yamada, Takeo; Ikeda, Miyuki; and Kimoto, Toshiyuki, 4,961,030, Cl. 315-368.000.

Kimura, Takeshi: *See*—
Mochiji, Kozo; Oizumi, Hiroaki; Soda, Yasunari; and Kimura, Takeshi, 4,960,676, Cl. 430-326.000.

Kinergy Corporation: *See*—
Dumbaugh, George D., 4,960,229, Cl. 222-161.000.

King, Michael T.; and Petges, Neal E., to General Binding Corporation. Single-side laminator. 4,960,484, Cl. 156-499.000.

Kinoshita, Mikio: *See*—
Ohta, Wasaburo; Kinoshita, Mikio; and Katsuragawa, Tadao, 4,960,072, Cl. 118-723.000.

Kinoshita, Tatsuo; Minami, Shuji; and Kanzaki, Shigeru, to Mitsui Petrochemical Industries, Ltd. External agent for the skin comprising a specific ethylenic copolymer. 4,960,875, Cl. 585-10.000.

Kinosz, Michael J.: *See*—
Fang, Que-Tsang; and Kinosz, Michael J., 4,960,163, Cl. 164-459.000.

Kinugawa Rubber Industrial Co., Ltd.: *See*—
Saito, Yoshio; and Yoshino, Shigeo, 4,960,375, Cl. 425-131.100.

Kioritz Corporation: *See*—
Sageshima, Akira; Ozaki, Tadashi; Kawasaki, Hirozi; and Masuda, Isao, 4,960,194, Cl. 192-103.00B.

Kipp, Thorwald; and Wiechers, Bernhard, to O&K Orenstein & Koppel Aktiengesellschaft. Open-cut mining cutter. 4,960,306, Cl. 299-41.000.

Kirby, Larry H.: *See*—
Bedell, Stephen A.; and Kirby, Larry H., 4,960,575, Cl. 423-222.000.
Bedell, Stephen A.; Hammond, Charles A.; and Kirby, Larry H., 4,960,576, Cl. 423-226.000.

Kirchberg, Maurice A., Jr., to Sundstrand Corporation. Voltage inverter control applying real-time angle pattern determination. 4,961,130, Cl. 363-41.000.

Kirchner, David L.: *See*—
Gerkin, Richard M.; and Kirchner, David L., 4,960,942, Cl. 564-479.000.

Kirin Brewery Co., Ltd.: *See*—
Takahashi, Yutaka; Harashima, Ikuo; Nakayama, Sunichi; Arai, Yasuyuki; Takayanagi, Yasushi; Sekiguchi, Ryoichi; Abe, Tomomitsu; and Hayakawa, Hiroshi, 4,960,228, Cl. 222-129.100.

Kiser, Thomas E., to Professional Supply, Inc. Regulation of atmospheric conditions within a confined space. 4,960,041, Cl. 98-1.500.

Kishi, Katsunobu, to Nitto Kohki Co., Ltd. Chamfering machine. 4,960,352, Cl. 409-180.000.

Kishi, Takao: *See*—
Iizuka, Shigeo; Kishi, Takao; Ogawa, Riichi; and Mizushima, Hiroshi, 4,960,339, Cl. 401-129.000.

Kitamura, Noboru: *See*—
Ogata, Hirofumi; and Kitamura, Noboru, 4,960,189, Cl. 192-41.00A.

Kitano, Motoi: *See*—
Yoshinaka, Minoru; Asakura, Eizo; Oku, Mitsumasa; Hamabe, Takeshi; Kitano, Motoi; and Yoshida, Hideyuki, 4,960,654, Cl. 428-614.000.

Klainer, Albert S.; and Bisaccia, Emil. Treatment methods and vaccines for stimulating an immunological response against retroviruses. 4,960,408, Cl. 604-4.000.

Klatt, Larry F. Cat toy. 4,960,075, Cl. 119-29.000.

Kleber, Rolf: *See*—
Wehowsky, Frank; Kleber, Rolf; and Jaeckel, Lothar, 4,960,543, Cl. 560-26.000.

Klein Bicycle Corporation: *See*—
Klein, Gary G.; and Gribb, Tye T., 4,960,402, Cl. 474-80.000.

Klein, Gary G.; and Gribb, Tye T., to Klein Bicycle Corporation. Anti-chain wrap device for bicycles. 4,960,402, Cl. 474-80.000.

Klein, Richard K.: *See*—
Dixit, Pankaj; Sliwa, Jack; Klein, Richard K.; Sander, Craig S.; and Farnaam, Mohammad, 4,960,732, Cl. 437-192.000.

Kleiner, Hans-Jerg; and Roscher, Gunter, to Hoechst Aktiengesellschaft. Process for the preparation of alkyl alkenylphosphinates. 4,960,919, Cl. 558-142.000.

Klemp, Helmut: *See*—
Klose, Werner; and Klemp, Helmut, 4,960,928, Cl. 562-21.000.

Klendworth, Douglas D.; and McDaniel, Max P., to Phillips Petroleum Company. Alumina phosphated with partial ester. 4,960,748, Cl. 502-210.000.

Kling, Tamara L. Fingernail protective device. 4,960,138, Cl. 132-73.000.

Klinge Pharma GmbH: *See*—
Woschina, Axel; and Grill, Helmut, 4,960,937, Cl. 564-324.000.

Klocke, James A.; and Yamasaki, Ronald B., to NPI. Salannin derivative insect control agents. 4,960,791, Cl. 514-468.000.

Klockner Ferromatik Desma GmbH: *See*—
Proll, Manfred, 4,960,374, Cl. 425-119.000.

Klockner-Humboldt-Deutz AG: *See*—
Esna-Ashari, Mohammed; Kellerwessel, Hans; Gemmer, Ludwig; and Hamacher, Gert-Helge, 4,960,461, Cl. 423-27.000.

Kloker, Werner; Freitag, Dieter; Uerdingen, Walter; Hess, Bernhard; and Schmid, Helmut, to Bayer Aktiengesellschaft. Curable reaction compositions for producing data carriers. 4,961,179, Cl. 369-288.000.

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Klumpp, Gunter: *See*—
Reuter, Alfred; and Klumpp, Gunter, 4,960,023, Cl. 83-368.000.

KMS Fusion, Inc.: *See*—
McKean, Ronald A.; and Stiegman, Jeff, 4,960,999, Cl. 250-461.100.

Knapp, Christopher E.: *See*—
Pellow, Scott W.; Trischuk, Ronald W.; Knapp, Christopher E.; and Bauer, Ralph, 4,960,441, Cl. 51-293.000.

Knight, Larry V.: *See*—
Perkins, Raymond T.; Thorne, James M.; Knight, Larry V.; and Woodbury, Richard C., 4,960,486, Cl. 156-633.000.

Knoll, Jozsef: *See*—
Ecsery, Zoltan, deceased; Knoll, Jozsef; Somfai, Eva; Torok, Zoltan; Szinnyei, Eva; and Mozsolics, Karoly, 4,960,797, Cl. 514-654.000.

Knoppik, Berthold: *See*—
Bruggendick, Hermann; Weber, Raimond; Richter, Ekkehard; and Knoppik, Berthold, 4,960,447, Cl. 55-390.000.

Knowles, Carl H., to Metrologic Instruments, Inc. Compact omnidirectional laser scanner. 4,960,985, Cl. 235-467.000.

Knudson, Mary L.: *See*—
Wisniewski, Karen L.; and Knudson, Mary L., 4,960,533, Cl. 252-142.000.

Kobata, Fumihiro: *See*—
Kawabata, Juheiji; Chiba, Manabu; Sugie, Toshinori; Kobata, Fumihiro; Izutsu, Hitoshi; Inoue, Toshio; and Mine, Takayuki, 4,960,841, Cl. 525-537.000.
Kotera, Kohichi; Sugie, Toshinori; Kobata, Fumihiro; Kawabata, Juheiji; and Hasegawa, Sugio, 4,960,861, Cl. 528-388.000.

Kobayashi, Haruyoshi: *See*—
Ohta, Hideo; and Kobayashi, Haruyoshi, 4,960,051, Cl. 101-349.000.

Kobayashi, Kazuo: *See*—
Shin, Yasuhiro; and Kobayashi, Kazuo, 4,961,015, Cl. 307-572.000.

Kobayashi, Kazutoshi: *See*—
Shimada, Junichi; Kobayashi, Kazutoshi; Moriyama, Norio; and Kawakami, Kazuhiko, 4,960,099, Cl. 123-647.000.

Kobayashi, Nobuaki: *See*—
Tamiya, Fumiyuki; Kobayashi, Nobuaki; and Fukuoka, Mitsuhiro, 4,960,340, Cl. 401-186.000.

Kobe Steel, Ltd.: *See*—
Okuda, Takanari; Nomura, Shigeo; Shibahara, Itaru; Tateishi, Yoshinori; Hirano, Susumu; Teranishi, Hiroshi; Fujiwara, Masayuki; and Nishida, Toshio, 4,960,562, Cl. 376-416.000.

Kobori, Takuji: *See*—
Yamada, Toshikazu; Kobori, Takuji; Sakamoto, Mitsuo; Maeda, Shozo; and Takahashi, Shinichi, 4,959,934, Cl. 52-167.00R.

Kodama, Churyo; Hirasawa, Yasuo; and Ohno, Yukio, to Hitachi, Ltd. Circular fluorescent lamp with oval section of tube. 4,961,024, Cl. 313-493.000.

Koedam, James G.: *See*—
Schultz, Donald C.; and Koedam, James G., 4,960,009, Cl. 74-473.00R.

Koenck, Steven E., to Norand Corporation. Battery conditioning system having communication with battery parameter memory means in conjunction with battery conditioning. 4,961,043, Cl. 320-21.000.

Koerber, Heinz; Hanke, Rudolf; Paessler, Helmar; Kessler, Bernd; Raetzsch, Manfred; Heger, Adolf; and Kolletzky, Karlheinz, to Veb Greika Greiz Weberei und Veredlung. Method for manufacturing of mat and rough, laminar, ribbon-shaped or fibrous polymeric products with a stream of particles. 4,960,430, Cl. 8-114.000.

Koestner, Roland J.: *See*—
Schaake, Herbert F.; and Koestner, Roland J., 4,960,728, Cl. 437-82.000.

Koga, Nobuhito: *See*—
Yamaya, Norimasa; Koga, Nobuhito; Ohta, Masahiro; and Yamaguchi, Akihiro, 4,960,852, Cl. 528-170.000.

Kohara, Masanobu: *See*—
Tada, Tetsuo; Takagi, Ryoichi; and Kohara, Masanobu, 4,961,052, Cl. 324-158.00P.

Kohler, Burkhard; and Meyer, Rolf-Volker, to Bayer Aktiengesellschaft. Polyarylene ether containing benzoxazole groups and a process for their preparation. 4,960,855, Cl. 528-211.000.

Koike, Michio: *See*—
Hanaoka, Kazuo; Chabata, Sueji; Koike, Michio; and Tsuboi, Takao, 4,960,641, Cl. 428-383.000.

Koike, Mikio: *See*—
Hanyu, Susumu; Kasuga, Noboru; Hara, Kazumasa; Koike, Mikio; and Ninijima, Mitsuru, 4,960,062, Cl. 112-255.000.

Koike, Yuzuru; Miyashita, Yukio; Akimoto, Yoshiaki; Seki, Yasunari; and Yahata, Isao, to Honda Giken Kogyo Kabushiki Kaisha. Knocking control system for internal combustion engines. 4,960,094, Cl. 123-425.000.

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Koizumi, Masumi: *See*—
Tomitaka, Kichinojo; Utsumi, Shigeo; and Koizumi, Masumi, 4,960,636, Cl. 428-220.000.

Kojima, Keiji: *See*—
Nakayama, Hiroshi; Kojima, Keiji; and Sato, Gen, 4,961,231, Cl. 382-21.000.

Kojima, Shingo, to NEC Corporation. Arithmetic processor performing mask and trap operations for exceptions. 4,961,161, Cl. 364-736.500.

Kojima, Tamotsu: *See*—
Kawashima, Yasuhiko; Tanaka, Shinri; Kojima, Tamotsu; and Kagawa, Nobuaki, 4,960,686, Cl. 430-522.000.

Kolletzky, Karlheinz: *See*—
Koerber, Heinz; Hanke, Rudolf; Paessler, Helmar; Kessler, Bernd; Raetzsch, Manfred; Heger, Adolf; and Kolletzky, Karlheinz, 4,960,430, Cl. 8-114.000.

Komarov, Nikolai N.: *See*—
Alexandrov, Maxim L.; Belenky, Boris G.; Gotlib, Vladimir A.; Vlasov, Arkady P.; Komarov, Nikolai N.; Sudiin, Valery V.; and Shevkunov, Vsevolod V., 4,960,516, Cl. 210-198.200.

Komatsu, Masato; Isoi, Masaaki; Baba, Isao; and Mikami, Takashi, to Tonen Sekiyukagaku Kabushiki Kaisha. Resin composition for bumpers. 4,960,823, Cl. 525-89.000.

Komatsu, Takahiro: *See*—
Kumanoya, Masaki; Konishi, Yasuhiro; Dosaka, Katsumi; Komatsu, Takahiro; and Tobita, Youichi, 4,961,007, Cl. 307-296.200.
Kumanoya, Masaki; Konishi, Yasuhiro; Dosaka, Katsumi; Komatsu, Takahiro; and Inoue, Yoshinori, 4,961,167, Cl. 365-189.090.

Komatsu, Takuichi: *See*—
Akao, Mutsuo; Watanabe, Seiichi; and Komatsu, Takuichi, 4,960,626, Cl. 428-36.920.

Komatsuzaki, Hiroshi; Kamata, Kazuo; Ohmiya, Akio; Nishimura, Syunji; Umeda, Yoshihito; Mochizuki, Noriya; and Furuya, Eiji, to Fuji Photo Film Co., Ltd.; and Nihon Seimitsu Kogyo Kabushiki Kaisha. Camera with changeable focal length. 4,961,084, Cl. 354-268.000.

Komori, Yumiko: *See*—
Nishikawa, Masayuki; Komori, Yumiko; Yokoi, Masaki; Ono, Masato; Takahashi, Noriyoshi; Fukuda, Yuzuru; Yagi, Shigeru; and Karakida, Ken-ichi, 4,960,662, Cl. 430-64.000.

Komurasaki, Satosi, to Mitsubishi Denki Kabushiki Kaisha. Acceleration detector. 4,959,993, Cl. 73-35.000.

Konai, Yutaka: *See*—
Terauchi, Takashi; Yoshida, Kazuo; Machida, Yoshihisa; Okubo, Nobuyuki; and Konai, Yutaka, 4,960,945, Cl. 568-323.000.

Kondo, Hitoshi: *See*—
Imahori, Kazutomo; Kondo, Hitoshi; Nakajima, Hiroshi; and Iwasaki, Tatsuo, 4,960,696, Cl. 435-42.000.

Konica Corporation: *See*—
Kawashima, Yasuhiko; Tanaka, Shinri; Kojima, Tamotsu; and Kagawa, Nobuaki, 4,960,686, Cl. 430-522.000.

Konishi, Masataka: *See*—
Nishio, Maki; Kakushima, Masatoshi; Konishi, Masataka; and Oki, Toshikazu, 4,960,755, Cl. 514-8.000.

Konishi, Yasuhiro: *See*—
Kumanoya, Masaki; Konishi, Yasuhiro; Dosaka, Katsumi; Komatsu, Takahiro; and Tobita, Youichi, 4,961,007, Cl. 307-296.200.
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Konishiroku Photo Industry Co., Ltd.: *See*—
Yamada, Hiroyuki; Takagiwa, Hiroyuki; Masaki, Hiroya; Kasuya, Takahira; Takahashi, Jiro; Uchida, Masafumi; and Ikeuchi, Satoru, 4,960,664, Cl. 430-109.000.

Konno, Hiroki; Yamamoto, Yasushi; and Sonegawa, Shigehisa, to Shin-Etsu Chemical Co., Ltd. Organic silicon compound having a cinnamilideneaminopropyl group. 4,960,918, Cl. 556-425.000.

Kono, Michikata; Wada, Yoshiyuki; Kamihara, Tetuya; Tatematsu, Masahito; and Suda, Koichi, to Aisan Kogyo Kabushiki Kaisha. Combustion system. 4,960,089, Cl. 123-260.000.

Koos, Inc.: *See*—
Connor, Margaret B.; and Tratnyek, Joseph P., 4,960,531, Cl. 252-70.000.

Kopco, James J.: *See*—
Sovis, John F.; Saunders, Craig M.; Kopco, James J.; and Wright, Michael F., 4,959,885, Cl. 15-335.000.

Koplick, Andrew J., to Victorian Solar Energy Council. Coating solutions. 4,960,466, Cl. 106-1.290.

Korbonits, Dezso; Heja, Gergely; Szomor, Maria; and Minker, Emil, to Chinoin Gyogyszer- es Vegyeszeti Termekek Gyara RT. Xanthine derivatives. 4,960,773, Cl. 514-234.210.

Koros, Robert M.: *See*—
Bhagat, Phiroz M.; Koros, Robert M.; Patel, Rutton D.; Peruyero, Jose M.; and Wyatt, John T., 4,960,571, Cl. 422-194.000.

Koseki, Shogo: *See*—
Nakagawa, Mitsuhisa; and Koseki, Shogo, 4,961,031, Cl. 315-382.000.

Koss, Walter. Penis erection testing and measuring device. 4,960,131, Cl. 128-774.000.

Kossiakoff, Nicolas: *See*—
Buckholz, Lawrence L., Jr.; Farbood, Mohamad I.; Kossiakoff, Nicolas; Scharpf, Lewis G.; and Seitz, Eugene W., 4,960,603, Cl. 426-536.000.

Kostal, Hubert; Luhn, Rodney C.; and Smith, Donald E., to AT&T Bell Laboratories. Atmosphric optical communication link. 4,960,315, Cl. 350-96.180.

Kosuga, Izumi; Otani, Kenichi; and Matsumuto, Kazuaki, to Furukawa Electric Co., Ltd., The. Pellets for making electromagnetic wave

shielding material and method for manufacturing the same. 4,960,642, Cl. 428-407.000.

Kotera, Kohichi; Sugie, Toshinori; Kobata, Fumihiro; Kawabata, Juheiji; and Hasegawa, Sugio, to Dainippon Ink and Chemicals, Inc. Multi layer process for producing arylene sulfide polymers. 4,960,861, Cl. 528-388.000.

Koterazawa, Toshiyuki: *See*—
Abukawa, Toshimi; Okuyama, Toshiaki; Tahara, Kazuo; Marumoto, Katsuji; Koterazawa, Toshiyuki; Hombu, Mitsuyuki; Takahashi, Tadashi; Ishikura, Hisatugu; Yamamura, Hirohisa; Tatsuzaki, Toru; Omae, Tsutomu; and Takamatsu, Shuichi, 4,960,178, Cl. 180-79.100.

Kowa Company, Ltd.: *See*—
Tanabe, Sohei; Sato, Seiichi; Kyotani, Yoshinori; Ohta, Tomio; and Uchida, Yasumi, 4,960,883, Cl. 540-575.000.

Koyo Seiko Co., Ltd.: *See*—
Katayama, Eiichi; Ueda, Kouichi; Takebayashi, Hiroaki; and Rokkaku, Kazuo, 4,960,405, Cl. 475-183.000.

Kraft, Inc.: *See*—
Trecker, Gary W.; and Monckton, Susan P., 4,960,605, Cl. 426-582.000.

Kramer, Wolfgang: *See*—
Holmwood, Graham; Kramer, Wolfgang; Regel, Erik; Elbe, Hans L.; Buchel, Karl H.; Dutzmann, Stefan; Brandes, Wilhelm; and Reinecke, Paul, 4,960,781, Cl. 514-383.000.

Kranis, Daniel, Sr., to Dana Corporation. Apparatus for cutting a wide sheet of metal material into a plurality of narrow strips. 4,959,986, Cl. 72-129.000.

Krautter, Martin: *See*—
Liegel, Jurgen; and Krautter, Martin, 4,961,001, Cl. 250-491.100.

Kravitz, Melvin. Power factor correction circuit for power supplies. 4,961,044, Cl. 323-205.000.

Krawietz, Stefan, to Zinser Textilmaschinen GmbH. Funnel for a spinning machine. 4,959,953, Cl. 57-354.000.

Kreft, Anthony F., III; Musser, John H.; Bicksler, James J.; Giberson, John W.; and Kubrak, Dennis M., to American Home Products Corporation. Naphthalenepropionic acid derivatives as anti-inflammatory/anti-allergic agents. 4,960,892, Cl. 546-152.000.

Kreidl, Janos: *See*—
Vedres, Andras; Szantay, Csaba; Stefko, Bela; Kreidl, Janos; Nemes, Andras; Blasko, Gabor; Bogsch, Erik; Mathe, Denes; Hegedus, Istvan; Szuchovszky, Adrien, nee Gergely; and Mester, Tamas, 4,960,888, Cl. 544-323.000.

Kremer, Henry A., to Carbochem Inc. Dust suppressant forming a resilient layer. 4,960,532, Cl. 252-88.000.

Krieger, Leo G.: *See*—
Werner, Kurt; Krieger, Leo G.; Bewley, Wilbur C.; and Tillman, Ennis L., 4,960,446, Cl. 55-312.000.

Krogh, Ole, to Tegal Corporation. Method of treating semiconductor wafers in a magnetically confined plasma at low pressure by monitoring peak to peak voltage of the plasma. 4,960,610, Cl. 427-39.000.

Krogsgaard-Larsen, Povl; Falch, Erik; and Pedersen, Henrik, to H. Lundbeck A/S. 5,6,7,8-tetrahydro-4H-isoxazolo[4,5-c]-azepine derivatives. 4,960,769, Cl. 514-215.000.

Krolikiewicz, Konrad: *See*—
Vorbrueggen, Helmut; and Krolikiewicz, Konrad, 4,960,907, Cl. 549-336.000.

Kronberger, Maximilian; and Drummer, Eugen, to Voest-Alpine Automotive Gesellschaft m.b.H. Diesel engine pump nozzle having a control sleeve. 4,960,241, Cl. 239-90.000.

Kroosa, John R. Apparatus for receipt and display of raster scan imagery signals in relocatable windows on a video monitor. 4,961,071, Cl. 340-721.000.

Krug, Heinz. Circuit arrangement for testing integrated circuit components. 4,961,053, Cl. 324-158.1OR.

Ku, Hao: *See*—
Steichen, Dale S.; Ku, Hao; and Lewis, Sheldon N., 4,960,925, Cl. 560-193.000.

Kubo, Hiroshi: *See*—
Kanai, Takao; Tanemoto, Kei; Kubo, Hiroshi; and Sato, Toyohiko, 4,960,734, Cl. 501-98.000.

Kubo, Isoroku: *See*—
O'Neill, Jeff S.; Schisler, H. Edmund; and Kubo, Isoroku, 4,960,080, Cl. 123-254.000.

Kubokawa, Hiroaki; Tsukaya, Takashi; Ueda, Yasuhiro; Nakamura, Takeaki; Ohshima, Yutaka; Hibino, Hiroki; Takayama, Shyuichi; and Hagino, Tadao, to Olympus Optical Co., Ltd. Endoscope apparatus. 4,960,106, Cl. 128-6.000.

Kubrak, Dennis M.: *See*—
Kreft, Anthony F., III; Musser, John H.; Bicksler, James J.; Giberson, John W.; and Kubrak, Dennis M., 4,960,892, Cl. 546-152.000.

Kuenast, Christoph: *See*—
Neubauer, Hans-Juergen; Buerstinghaus, Rainer; Kuenast, Christoph; and Hofmeister, Peter, 4,960,796, Cl. 514-624.000.

Kuhn, Rainer; Marhold, Albrecht; and Dicke, Hans-Rudolf, to Bayer Aktiengesellschaft. Use of fluoromethylphenols as solvents for LC-polymers, and new fluoromethylphenols. 4,960,539, Cl. 252-299.500.

Kumagai, Yomoharu; Hirose, Masato; and Nishikawa, Masao, to Honda Giken Kogyo Kabushiki Kaisha. Arm structure for articulated mechanism. 4,960,040, Cl. 92-261.000.

Kumanoya, Masaki; Konishi, Yasuhiro; Dosaka, Katsumi; Komatsu, Takahiro; and Tobita, Youichi, to Mitsubishi Denki Kabushiki Kaisha. Substrate bias potential generator of a semiconductor integrated circuit device and a generating method therefor. 4,961,007, Cl. 307-296.200.

Kumanoya, Masaki; Konishi, Yasuhiro; Dosaka, Katsumi; Komatsu, Takahiro; and Inoue, Yoshinori, to Mitsubishi Denki Kabushiki Kaisha. Substrate bias generator in a dynamic random access memory with auto/self refresh functions and a method of generating a substrate bias therein. 4,961,167, Cl. 365-189.090.

Kumpe, Gerhardt; Wormsbacher, Wilfried; Heimburger, Norbert; Fuhge, Peter; and Preis, Hans M., to Behringwerke Aktiengesellschaft. Pasteurized human fibrinogen (HF), a process for its preparation, and its use. 4,960,757, Cl. 514-21.000.

Kupferschmidt, Albert: *See*—
Marks, Robert J.; and Kupferschmidt, Albert, 4,960,394, Cl. 439-719.000.

Kuraray Co., Ltd.: *See*—
Oda, Hidemasa; Moritani, Tohei; Hirofuji, Satoshi; and Okuno, Kenji, 4,960,639, Cl. 428-34.500.

Kureha Chemical Industry Co., Ltd.: *See*—
Hori, Saburo; and Kurita, Ryuichi, 4,960,738, Cl. 501-128.000.

Kureha Kagaku Kagyo K.K.: *See*—
Satake, Yoshikatsu; Yamamoto, Shinji; Kaneko, Takashi; Tada, Masahito; Kashiwadate, Ken; Mizuno, Toshiya; Endo, Hiroyuki; Katto, Takayuki; and Shiiki, Zenya, 4,960,806, Cl. 524-100.000.

Kureha Kagaku Kogho K.K.: *See*—
Satake, Yoshikatsu; Yamamoto, Shinji; Kaneko, Takashi; Tada, Masahito; Kashiwadate, Ken; Mizuno, Toshiya; Endo, Hiroyuki; Katto, Takayuki; and Shiiki, Zenya, 4,960,555, Cl. 264-288.400.

Kureha Kagaku Kogyo K.K.: *See*—
Terauchi, Takashi; Yoshida, Kazuo; Machida, Yoshihisa; Okubo, Nobuyuki; and Konai, Yutaka, 4,960,945, Cl. 568-323.000.

Kurihara, Sakuo, to Tochigifujisangyo Kabushiki Kaisha. Hub clutch. 4,960,192, Cl. 192-67.00R.

Kurita, Ryuichi: *See*—
Hori, Saburo; and Kurita, Ryuichi, 4,960,738, Cl. 501-128.000.

Kuroda, Kouichi; Hayashi, Chihiro; and Nakasuji, Kazuyuki, to Sumitomo Metal Industries Ltd. Method of manufacturing metallic tube with spiral fin. 4,959,985, Cl. 72-97.000.

Kuroda, Shigeru; Mimura, Takashi; and Notomi, Seishi, to Fujitsu Limited. Compound semiconductor device having nonalloyed ohmic contacts. 4,961,194, Cl. 357-22.000.

Kuroiwa, Mitsuyuki: *See*—
Toibana, Hisaharu; Kuroiwa, Mitsuyuki; and Todo, Akira, 4,960,627, Cl. 428-64.000.

Kurokawa, Toshiko: *See*—
Horiuchi, Tatsuo; and Kurokawa, Toshiko, 4,960,701, Cl. 435-190.000.

Kurtz, Milton C.: *See*—
Williams, Roger O.; Kurtz, Milton C.; Godwin, Jimmy D.; Williams, Stephen P.; and Roberts, Gregory K., 4,961,123, Cl. 360-131.000.

Kusakabe, Hideshi, to Diesel Kiki Co., Ltd. Air-conditioning control system with freezing chamber-equipped refrigerator for vehicles. 4,959,974, Cl. 62-228.500.

Kusakabe, Kouichi; Hayasaka, Ryozo; and Kato, Kanami, to Signode Corporation. Bonding method of binding strap end portions by spot-welding. 4,960,968, Cl. 219-78.010.

Kushida, Naoki: *See*—
Tohma, Koichi; Hasegawa, Tetsuo; Kushida, Naoki; Tamura, Yasuyuki; Yaegashi, Hisao; and Suzuki, Takayuki, 4,960,632, Cl. 428-212.000.

Kuwaoka, Toshiharu, to Victor Company of Japan, Ltd. Interface circuit. 4,961,205, Cl. 375-36.000.

Kuwata, Satoshi: *See*—
Sakuta, Koji; Kuwata, Satoshi; and Mori, Shigeru, 4,960,898, Cl. 548-110.000.

Kyotani, Yoshinori: *See*—
Tanabe, Sohei; Sato, Seiichi; Kyotani, Yoshinori; Ohta, Tomio; and Uchida, Yasumi, 4,960,883, Cl. 540-575.000.

L.O.N. Research, Inc.: *See*—
Noce, Louis O.; and Basta, Michael, 4,960,127, Cl. 128-675.000.

Labaudiniere, Richard: *See*—
Bourzai, Jean-Dominique; Capet, Marc; Cotrel, Claude; Labaudiniere, Richard; Pitchen, Philippe; and Roussel, Gerard, 4,960,779, Cl. 514-300.000.

Labivia - S.G.E.: *See*—
Gernot, Philippe, 4,961,145, Cl. 364-426.020.

Laboratorios Vinas, S.A.: *See*—
Buxade, Antonio, 4,960,917, Cl. 556-131.000.

Lachhein, Stephen; and Ressel, Hans-Joachim, to Hoechst Aktiengesellschaft. Process for the preparation of pyrimidines. 4,960,887, Cl. 544-320.000.

Lackie, C. Willard; and Talati, Kiritkumar, to VISystems, Inc. Method for providing a virtual execution environment on a target computer using a virtual software machine. 4,961,133, Cl. 364-200.000.

Lacks, Sanford A., to Associated Universities, Inc. Recombinant plasmids for encoding restriction enzymes DpnI and DpnII of streptococcus pneumontae. 4,960,707, Cl. 435-320.000.

Lacolle, Jean-Yves: *See*—
Danree, Bernard; Houziaux, Patrick; Lacolle, Jean-Yves; and Riffaud, Jean-Pierre, 4,960,900, Cl. 548-203.000.

Ladouceur, Lawrence: *See*—
Elliott, John C.; O'Connell, James A.; Ladouceur, Lawrence; Altman, William; and Jarett, Keith, 4,961,142, Cl. 364-408.000.

LaFountain, Robert H., to Automotive Products plc. Method and apparatus for prefilling hydraulic control apparatus. 4,959,960, Cl. 60-533.000.

Lahm, George P., to Du Pont de Nemours, E. I., and Company. Insecticidal substituted indazoles. 4,960,784, Cl. 514-403.000.

Lalfer, Jean P.: *See—*
de Givry, Jacques; Vallet, Jean C.; and Lalfer, Jean P., 4,959,900, Cl. 29-840.000.

Lambert, David V.: *See—*
Goldenfield, Mark P.; and Lambert, David V., 4,960,984, Cl. 235-462.000.

Lambert, Harvey J.; and Kennedy, Lawrence C., to General Motors Corporation. Preloaded control arm for a viscous fluid clutch. 4,960,191, Cl. 192-58.00B.

Lambert, Patrick M.: *See—*
Bryan, Philip S.; Lambert, Patrick M.; Towers, Christine M.; and Jarrold, Gregory S., 4,961,004, Cl. 250-483.100.

Lamm, Gunther: *See—*
Hansen, Guenter; Lamm, Gunther; Reichelt, Helmut; and Schefczik, Ernst, 4,960,873, Cl. 534-765.000.

Landman, Marc M.; Whitman, Steven M.; and Duncan, Robert J., to Emhart Industries, Inc. Surface mount machine with lead coplanarity verifier. 4,959,898, Cl. 29-705.000.

Lang, Gerard: *See—*
Junino, Alex; Vandenbossche, Jean J.; Borowiak, Herve; and Lang, Gerard, 4,960,432, Cl. 8-411.000.

Lanocare Laboratories: *See—*
Hagen, Resheda; and Barnett, Gabriel, 4,960,592, Cl. 424-537.000.

Lansford, Jerry R., to Chevron Corporation. Process for separation of hydrocarbon vapors and apparatus therefor. 4,960,443, Cl. 55-45.000.

Lanxide Technology Company, LP: *See—*
Luxzsz, Stanley J.; and Urquhart, Andrew W., 4,960,736, Cl. 501-127.000.

Lanzani, Emanuele, to Frimont S.p.A. Automatic device for producing ice cubes. 4,959,967, Cl. 62-138.000.

Lapidus, Herbert; and Carrier, George F., to Combe Incorporated. Animal collar. 4,960,077, Cl. 119-106.000.

Lappi, Erkki, to Wartsila Meriteollisuus Oy. Cabin unit arrangement. 4,959,933, Cl. 52-79.700.

LaRossa, Bernard J.; and Maidenburg, Mark A. Foldable weight lifter's bench. 4,960,277, Cl. 272-123.000.

Larson, David L., to Rosco Manufacturing Company. Asphalt distributor. 4,960,242, Cl. 239-168.000.

Larson, John G.: *See—*
Goldman, Robert P.; and Larson, John G., 4,960,331, Cl. 356-350.000.

Lassiter, Jimmie F., Jr.; and Slager, David R., to Meyer Machine Company. Bucket distribution system. 4,960,199, Cl. 198-494.000.

Lau, Arthur L., to Miles Inc. Device and method of assaying for trace mounts of proteins. 4,960,710, Cl. 436-86.000.

Lau, Chi-Leung, to Bell Communications Research, Inc. Synchronous frequency encoding technique for clock timing recovery in a broadband network. 4,961,188, Cl. 370-94.200.

Laursen, Jens, to JL Forklift Truck A/S. Mobile fork lifting apparatus. 4,960,357, Cl. 414-667.000.

Lautzenhiser, Gary A.: *See—*
Lautzenhiser, John L.; and Lautzenhiser, Gary A., 4,960,287, Cl. 280-304.100.

Lautzenhiser, John L.; and Lautzenhiser, Gary A. Quick-release mount for batteries. 4,960,287, Cl. 280-304.100.

Lavan, Michael J.; Edlin, George R.; and Whitener, Daniel L., to United States of America, Army. Non coherent photoneutralizer. 4,960,990, Cl. 250-251.000.

Lavoie, Serge: *See—*
Dube, Ghyslain; Huni, Jean-Paul; Lavoie, Serge; and Stevens, Wesley D., 4,960,460, Cl. 75-10.190.

Law, Kam S.; Leung, Cissy; Tang, Ching C.; Collins, Kenneth S.; Chang, Mei; Wong, Jerry Y. K.; and Wang, David Nin-Kou, to Applied Materials, Inc. Reactor chamber self-cleaning process. 4,960,488, Cl. 156-643.000.

Law, Waisiu: *See—*
Pirastehfar, Hassan; Onodera, George C.; Law, Waisiu; and Heminger, David M., 4,961,097, Cl. 357-30.000.

Lazouni, Abdelkrim: *See—*
Nguyen, Thinn; Lazouni, Abdelkrim; and Doan, Kim S., 4,960,494, Cl. 204-67.000.

Lazzeroni, Edward J., Jr.: *See—*
Aiello, Salvatore F.; Brown, Jeffrey K.; Karasek, Donald F.; Lazzeroni, Edward J., Sr.; Lazzeroni, Edward J., Jr.; Quella, John F.; and Zollers, Timothy E., 4,959,923, Cl. 43-112.000.

Lazzeroni, Edward J., Sr.: *See—*
Aiello, Salvatore F.; Brown, Jeffrey K.; Karasek, Donald F.; Lazzeroni, Edward J., Sr.; Lazzeroni, Edward J., Jr.; Quella, John F.; and Zollers, Timothy E., 4,959,923, Cl. 43-112.000.
Nelson, Kurt D.; Sus, Joseph E.; Lazzeroni, Edward J., Sr.; Zollers, Timothy E.; and Hanko, Jimmy J., 4,959,925, Cl. 43-125.000.

Leach, Norman. Powered heavy-duty hand truck. 4,960,179, Cl. 180-8.200.

Leaver, Alan T.: *See—*
Brierley, David; and Leaver, Alan T., 4,960,434, Cl. 8-524.000.

Lebrun, Jean-Jacques: *See—*
Billet, Lucien; and Lebrun, Jean-Jacques, 4,960,850, Cl. 528-23.000.

Lechaton, John S.; and Schepis, Dominic J., to International Business Machines Corporation. BiCMOS process. 4,960,726, Cl. 437-59.000.

Le Comte, Marcel: *See—*
Marin, Eric; and Le Comte, Marcel, 4,960,181, Cl. 181-106.000.

Le Donne, Robert D. Portable loud speaker system. 4,961,227, Cl. 381-24.000.

Leduc, Gerard: *See—*
Debregeas, Patrice; Leduc, Gerard; and Boyer, Jean-Francois, 4,960,596, Cl. 424-458.000.

Lee, Gae C.: *See—*
Kim, Jong S.; Han, Min S.; Lim, Bun S.; Lee, Gae C.; and Lee, Seung T., 4,960,930, Cl. 562-443.000.

Lee, Seung T.: *See—*
Kim, Jong S.; Han, Min S.; Lim, Bun S.; Lee, Gae C.; and Lee, Seung T., 4,960,930, Cl. 562-443.000.

Leggett & Platt, Incorporated: *See—*
Scott, Terence A., 4,960,267, Cl. 267-91.000.

Lehmann, Urs, to Ciba-Geigy Corporation. Heavy metal complex azo dyes containing a benzothiophene-1,1-dioxide, 2,1-benzothiazine-2,2-dioxide, 1,4-benzothiazine-1,1-dioxide or thienopyridine-1,1-dioxide coupling component. 4,960,870, Cl. 534-619.000.

Leitz, Edgar: *See—*
Eichenauer, Herbert; Leitz, Edgar; Ott, Karl-Heinz; and Pischtschan, Alfred, 4,960,822, Cl. 525-67.000.

Leland Stanford Junior University, The Board of Trustees of the: *See—*
Sinton, Ronald A.; and Swanson, Richard M., 4,960,468, Cl. 136-259.000.

Lele, Padmakar P., to Massachusetts Institute of Technology. Multipurpose temperature sensing probe for hyperthermia therapy. 4,960,109, Cl. 128-736.000.

Lemelson, Jerome H. Composite synthetic materials. 4,960,643, Cl. 428-408.000.

Lenck, Norbert; and Worner, Jorg, to Nukem GmbH. Device for cleaning in particular of disc-shaped oxide substrates. 4,960,141, Cl. 134-61.000.

Lendermon, Gary M.: *See—*
Parrott, Robert A.; and Lendermon, Gary M., 4,960,171, Cl. 166-55.000.

Lennington, John W.: *See—*
McDougal, John A.; and Lennington, John W., 4,960,093, Cl. 123-416.000.

Lentrichia, Brian B.; and Turanchik, Michael F., to Fisher Scientific Company. Assay employing binding pair members on particles and on a filter or membrane. 4,960,692, Cl. 435-7.000.

Leonard, Charles F. Truck mud flap support arm. 4,960,294, Cl. 280-848.000.

Leopold & Co. Chem. Pharm. Fabrik Gesellschaft M.B.H.: *See—*
Reichel, Erich; Schmidt-Kloiber, Heinz; and Groke, Karl, 4,960,108, Cl. 128-24.00A.

Leporcq, Bruno: *See—*
Verdier, Claude; Leporcq, Bruno; Georges, Eric; and Barraud, Roger, 4,961,200, Cl. 372-89.000.

Le Roy, Pierre; and Mandard-Cazin, Bernadette, to Rhone-Poulenc Sante. Process for the preparation of cyclic sulphates. 4,960,904, Cl. 549-34.000.

Lesieur, Daniel; Abdellatifi, Nourddine; Aichaoui, Hocine; and Bonnet, Jacqueline, to ADIR Et Cie. New benzoxazolinone compounds. 4,960,778, Cl. 514-253.000.

Lesko, Bradley P.: *See—*
Slautterback, Fred A.; Faulkner, W. Harrison, III; and Lesko, Bradley P., 4,960,619, Cl. 427-265.000.

Lessard, William W.: *See—*
Levene, Martin M.; and Lessard, William W., 4,960,019, Cl. 83-19.000.

L'Etat Francais representa par le Ministre des Poste, Telecommunications et de l'Espace (Centre National d'Etudes des Telecommunications: *See—*
Abiven, Jacques, 4,961,221, Cl. 380-21.000.

Letton, James A.: *See—*
Kester, Jeffrey J.; Bernhardt, Christian A.; Elsen, Joseph J.; Letton, James A.; and Fox, Mary M., 4,960,600, Cl. 426-310.000.

Leung, Cissy: *See—*
Law, Kam S.; Leung, Cissy; Tang, Ching C.; Collins, Kenneth S.; Chang, Mei; Wong, Jerry Y. K.; and Wang, David Nin-Kou, 4,960,488, Cl. 156-643.000.

Levene, Martin M.; and Lessard, William W., to Ontario Die Company, Ltd. Vacuum die cutting method and apparatus. 4,960,019, Cl. 83-19.000.

Lever Brothers Company: *See—*
Van Putte, Karel P.; and Muller, Johannes J., 4,960,544, Cl. 260-420.000.

Levinson, Gerald C. Automobile electronic-component anti-theft device. 4,960,623, Cl. 428-31.000.

Levy, Michael J.: *See—*
Weagley, Ronald J.; Fuller, Timothy J.; and Levy, Michael J., 4,960,666, Cl. 430-109.000.

Lewis, Sheldon N.: *See—*
Steichen, Dale S.; Ku, Hao; and Lewis, Sheldon N., 4,960,925, Cl. 560-193.000.

Liang, Rong-Chang: *See—*
Hammann, William A., IV; Liang, Rong-Chang; Thomas, Teresa M.; and Hipps, Jesse, Sr., 4,960,750, Cl. 503-214.000.

Liebenrood, John D.; and McMahon, Donald H., to Photon Kinetics Inc. Optical time domain reflectometer having a receiver with selectively controlled gain. 4,960,989, Cl. 250-227.150.

Liegel, Jurgen; and Krautter, Martin, to Carl-Zeiss-Stiftung. Method for compensating for environmental parameters on the imaging characteristics of an optical system. 4,961,001, Cl. 250-491.100.

Lilie, Dietmar E. B., to Empresa Brasileira de Compressores S/A-Embraco. Suction system for hermetic compressor of refrigeration. 4,960,368, Cl. 417-312.000.

Liljestrand, Lars: *See—*
Bergsjo, Nils-Johan; and Liljestrand, Lars, 4,961,066, Cl. 338-32.00S.

Lim, Bun S.: *See*—
Kim, Jong S.; Han, Min S.; Lim, Bun S.; Lee, Gae C.; and Lee, Seung T., 4,960,930, Cl. 562-443.000.

Lin, Chien-Hung. Automotive suspension system. 4,960,291, Cl. 280-710.000.

Lin, Henry C.: *See*—
O'Reilly, Neil J.; Sojka, Stanley A.; and Lin, Henry C., 4,960,938, Cl. 564-366.000.

Lin, Li-Ju J.: *See*—
Homola, Andrew M.; Lin, Li-Ju J.; and Saperstein, David D., 4,960,609, Cl. 427-38.000.

Lindel, Hans: *See*—
Bonse, Gerhard; Hallenbach, Werner; Lindel, Hans; and Berschauer, Friedrich, 4,960,783, Cl. 514-387.000.

Lindner, Christian; Wulff, Claus; and Ott, Karl-Heinz, to Bayer Aktiengesellschaft. Process for recovering thermoplastic polymers from dispersion. 4,960,864, Cl. 528-486.000.

Lingle, Philip J., to Guardian Industries Corp. Heat treatable sputter-coated glass. 4,960,645, Cl. 428-432.000.

Linhart, Claud H., to U. S. Philips Corporation. X-ray apparatus comprising a film cassette which is displaceable in a carriage. 4,961,213, Cl. 378-181.000.

Linke, Siegfried W.: *See*—
Zerbes, Rudolf; Linke, Siegfried W.; Mohrmann, Karl H.; and Reiser, Wolf, 4,960,911, Cl. 549-519.000.

Linnemann, Kurt: *See*—
Linnemann, Thomas; and Linnemann, Kurt, 4,960,136, Cl. 128-845.000.

Linnemann, Thomas; and Linnemann, Kurt, to Radiation Management Consultants, Inc. Folded disposable decontamination unit. 4,960,136, Cl. 128-845.000.

Littke, Walter; and Schoen, Erhard, to Messerschmitt-Bolkow-Blohm GmbH. Method and apparatus for crystallizing substances dissolved in a liquid at zero-gravity. 4,960,572, Cl. 422-245.000.

Littmann, Dieter: *See*—
Beck, Erich; Bronstert, Bernd; Huemmer, Wolfgang; and Littmann, Dieter, 4,960,673, Cl. 430-271.000.

Litton Systems, Inc.: *See*—
Dankowych, John A., 4,960,319, Cl. 350-96.290.
Goldman, Robert P.; and Larson, John G., 4,960,331, Cl. 356-350.000.

Liu, Ching Chao: *See*—
Hong, Le Thieu; Givens, Cynthia; Liu, Ching Chao; Wright, Michael J.; and Fatehi, Feyzi, 4,961,139, Cl. 364-200.000.

Liu, Yung S.: *See*—
Cole, Herbert S.; and Liu, Yung S., 4,960,613, Cl. 427-53.100.

Livingston Products, Inc.: *See*—
Livingston, Troy W., 4,960,180, Cl. 180-9.280.

Livingston, Troy W., to Livingston Products, Inc. Wheelchair. 4,960,180, Cl. 180-9.280.

Lo, Grace Y.; Otterbacher, Eric W.; Bezoari, Massimo D.; and Walther, Brian W., to Dow Chemical Company, The. Amine containing initiator system for anionic polymerization. 4,960,842, Cl. 526-175.000.

Lo, Kwan Y.: *See*—
Inculet, Ion I.; and Lo, Kwan Y., 4,960,524, Cl. 210-747.000.

Lo, Young S., to A. H. Robins Company, Inc. Process for the preparation of 5-chloro and 5-bromo-2-hydroxynicotinic acids. 4,960,896, Cl. 546-298.000.

Lockaby, Jerle, to Specialized Hunting Equipment. Fuse tube for power and cutout fuses. 4,961,063, Cl. 337-241.000.

Loegel, Charles; Durr, Isabelle; Reichert, Sylvie; Loegel, Patrick; and Schneider, Francine, to CIWJ Compagnie Internationale du Water Jet. Device for cutting, drilling or similar working of rock, ore, concrete or the like. 4,960,176, Cl. 175-424.000.

Loegel, Patrick: *See*—
Loegel, Charles; Durr, Isabelle; Reichert, Sylvie; Loegel, Patrick; and Schneider, Francine, 4,960,176, Cl. 175-424.000.

Logsdon, Peter B.; Stachura, Leonard M.; Swan, Ellen L.; and Basu, Rajat S., to Allied-Signal Inc. Azeotrope-like compositions of 1,1-dichloro-1-fluoroethane, dichlorotrifluoroethane and a mono- or di-chlorinated C_2 or C_3 alkane. 4,960,535, Cl. 252-171.000.

Lomas, David A.: *See*—
Haun, Edward C.; Milner, Steven S.; and Lomas, David A., 4,960,503, Cl. 208-85.000.

Long, Gary N.: *See*—
Pellet, Regis J.; Rabo, Jule A.; Long, Gary N.; Gortsema, Frank P.; and Springer, Albert R., 4,960,504, Cl. 208-411.000.

Long, James F.: *See*—
Bliem, Rudolf F.; and Long, James F., 4,960,706, Cl. 435-284.000.

Loomis, James R.: *See*—
Boyko, Christina M.; Johnston, Craig N.; Loomis, James R.; Samuelson, Carl E.; and Schumacher, Ricahrd A., 4,960,634, Cl. 428-220.000.

Looney, Catharine E.: *See*—
Dubin, Alan S.; Looney, Catharine E.; and Schmidt, Steven P., 4,960,660, Cl. 430-49.000.

Lore, Xavier R. Y.: *See*—
Dubois, Claude A. G.; and Lore, Xavier R. Y., 4,960,243, Cl. 239-265.290.

L'Oreal: *See*—
Junino, Alex; Vandenbossche, Jean J.; Borowiak, Herve; and Lang, Gerard, 4,960,432, Cl. 8-411.000.
Sebag, Henri; and Beck, Irina, 4,960,772, Cl. 514-231.200.

Lorenz, Achim R., to MacMillan Bloedel Containers. 2-piece pizza box with cut-out corners. 4,960,238, Cl. 229-125.290.

Lorenz, Gisela: *See*—
Rentzea, Costin; Ammermann, Eberhard; and Lorenz, Gisela, 4,960,774, Cl. 514-239.200.

Lorenz, Josef; and Kicherer, Robert, to E.G.O. Elektro-Gerate Blanc u. Fischer. Cooking appliance. 4,960,978, Cl. 219-455.000.

Lovitt, Estel L., Jr. Demountable swing boom hoist for front end loaders. 4,960,359, Cl. 414-686.000.

Lowes, Albert R., to Mydax, Inc. Wide range refrigeration system with suction gas cooling. 4,959,972, Cl. 62-200.000.

Lubrizol Corporation, The: *See*—
Yodice, Richard, 4,960,761, Cl. 502-159.000.

Lucien, Jacques: *See*—
Minderhoud, Johannes K.; and Lucien, Jacques, 4,960,505, Cl. 208-143.000.

Luckanuck, John S., to Radixx/World, Ltd. Method of insulating with inorganic non-combustible foam. 4,960,621, Cl. 427-397.800.

Luderer, Albert A.: *See*—
Harvey, Michael A.; Manning, Brenda D.; Nicholson, Mary L.; Travis, Karen L.; and Luderer, Albert A., 4,960,716, Cl. 436-542.000.

Lugosi, Gyorgy: *See*—
Szalay, Erzsebet; Lugosi, Gyorgy; Kallay, Tamas U.; Nad, Zsuzsanna; Jelinek, Istvan; Simonidesz, Vilmos; Gyory, Peter; Nagy, Lajos; Lugosi, Marta; Santa nee Singola, Ilona; Besenyei, Gabor; and Simandi, Laszlo , 4,960,913, Cl. 552-206.000.

Lugosi, Marta: *See*—
Szalay, Erzsebet; Lugosi, Gyorgy; Kallay, Tamas U.; Nad, Zsuzsanna; Jelinek, Istvan; Simonidesz, Vilmos; Gyory, Peter; Nagy, Lajos; Lugosi, Marta; Santa nee Singola, Ilona; Besenyei, Gabor; and Simandi, Laszlo , 4,960,913, Cl. 552-206.000.

Luhn, Rodney C.: *See*—
Kostal, Hubert; Luhn, Rodney C.; and Smith, Donald E., 4,960,315, Cl. 350-96.180.

Lundell, Vernon J. Compost shredder. 4,960,247, Cl. 241-188.00R.

Lundstrom, Robert W.; and Sells, Robert A., to DataCard Corporation. Topping foil loading mechanism and method. 4,960,047, Cl. 101-27.000.

Lurssen, Klaus: *See*—
Holmwood, Graham; Regel, Erik; Jager, Gerhard; Buchel, Karl H.; Lurssen, Klaus; Frohberger, Paul-Ernst; Brandes, Wilhelm; and Paul, Volker, 4,960,456, Cl. 71-92.000.

Lux, Mathias: *See*—
Schleppinghoff, Bernhard; Malessa, Reiner; Gabel, Christian; Scheef, Hans-Volker; and Lux, Mathias, 4,960,961, Cl. 568-899.000.

Luxzsz, Stanley J.; and Urquhart, Andrew W., to Lanxide Technology Company, LP. Surface bonding of ceramic bodies. 4,960,736, Cl. 501-127.000.

Lyon, Richard A. Diver's utility console. 4,960,399, Cl. 441-136.000.

Lythgoe, David J.: *See*—
Ashton, Michael J.; Bridge, Andrew W.; Dron, Donald I.; Fenton, Garry; Lythgoe, David J.; Newton, Christopher G.; Riddell, David; Smith, Christopher; and Stuttle, Keith A. J., 4,960,775, Cl. 514-248.000.

Maachi, Belaid: *See*—
Rousset, Abel; Maachi, Belaid; Gilot, Bernard; and Gougeon, Michel, 4,960,583, Cl. 423-633.000.

Maag, Gustav A.; and Wells, John N., to Schering Corporation. Atomizing nozzle assembly. 4,960,244, Cl. 239-424.000.

Machado, Octavio; Henry, Clifford W.; Congleton, Ray L.; and Flynn, William M., to Westinghouse Electric Corp. Spent fuel storage rack for BWR fuel assemblies. 4,960,560, Cl. 376-272.000.

Machida, Yoshihisa: *See*—
Terauchi, Takashi; Yoshida, Kazuo; Machida, Yoshihisa; Okubo, Nobuyuki; and Konai, Yutaka, 4,960,945, Cl. 568-323.000.

MacMillan Bloedel Containers: *See*—
Lorenz, Achim R., 4,960,238, Cl. 229-125.290.

MacMinn, Stephen R., to General Electric Company. Torque estimator for switched reluctance machines. 4,961,038, Cl. 318-696.000.

Madler, Eckerhard: *See*—
Neuman, Manfred; ZeiBig, Gerhard; Ihle, Karl-Heinz; Madler, Eckerhard; Schiller, Siegfried; and Schroller, Rudolf, 4,960,607, Cl. 427-8.000.

Maeda, Shozo: *See*—
Yamada, Toshikazu; Kobori, Takuji; Sakamoto, Mitsuo; Maeda, Shozo; and Takahashi, Shinichi, 4,959,934, Cl. 52-167.00R.

Maeda, Takeshi: *See*—
Saito, Atsushi; and Maeda, Takeshi, 4,961,182, Cl. 369-124.000.

Magnani, Sivio, to ICF Compagnia Italiana Finanaziaria SpA. Corrugated roofing sheets of synthetic fiber-reinforced cement, with a rough surface due to the presence of granular material. 4,960,616, Cl. 427-186.000.

Magon, Imrych. Water immersion amusement apparatus. 4,960,275, Cl. 272-32.000.

Maher, John W.; Mulford, Keith I.; and Tykal, James C., to Motorola, Inc. Radio console with CRT display. 4,961,070, Cl. 340-721.000.

Mahulikar, Deepak: *See*—
Butt, Sheldon H.; and Mahulikar, Deepak, 4,961,106, Cl. 357-74.000.

Maidenburg, Mark A.: *See*—
LaRossa, Bernard J.; and Maidenburg, Mark A., 4,960,277, Cl. 272-123.000.

Maker, Philip J., to Telectronics N.V. Differentiating between arrhythmia and noise in an arrhythmia control system. 4,960,123, Cl. 128-419.00D.

Maki, Yasuhiko: *See*—
Fujitsu Limited; Maki, Yasuhiko; and Nomura, Osamu, 4,961,170, Cl. 365-190.000.
Makihara, Akira: *See*—
Matsumoto, Yoshiro; and Makihara, Akira, 4,960,568, Cl. 422-83.000.
Malbe, Serge: *See*—
Fouche, Alain; and Malbe, Serge, 4,960,973, Cl. 219-121.640.
Malessa, Reiner: *See*—
Schleppinghoff, Bernhard; Malessa, Reiner; Gabel, Christian; Scheef, Hans-Volker; and Lux, Mathias, 4,960,961, Cl. 568-899.000.
Malfroy-Camine, Bernard; and Schofield, Peter R., to Genentech, Inc. Compositions and methods for the synthesis and assay of a mammalian enkephalinase. 4,960,700, Cl. 435-172.300.
Malinoski, David A.; and Conde, Robert V., to United Technologies Corporation. Method of making fused hollow composite articles. 4,960,451, Cl. 65-3.200.
Malpass, Dennis B.: *See*—
Crapo, Clark C.; and Malpass, Dennis B., 4,960,878, Cl. 556-179.000.
Malsbury, Alan J.: *See*—
DiGiacomo, Frank A.; Malsbury, Alan J.; and Myszka, Ronald T., 4,960,358, Cl. 414-684.300.
MAN Nutzfahrzeuge GmbH: *See*—
Hagin, Faust; and Drewitz, Hans, 4,959,962, Cl. 60-626.000.
Man Roland Druckmaschinen AG: *See*—
Hummel, Peter; and Holl, Roland, 4,960,053, Cl. 101-350.000.
Mancini, Peter: *See*—
Greenway, John M.; Schortmann, Walter E.; Mancini, Peter; Metrick, Dennis; and Connolly, Timothy, 4,960,630, Cl. 428-131.000.
Mandard-Cazin, Bernadette: *See*—
Le Roy, Pierre; and Mandard-Cazin, Bernadette, 4,960,904, Cl. 549-34.000.
Mangan, Ciaron: *See*—
Siddiqi, Iqbal; and Mangan, Ciaron, 4,960,693, Cl. 435-7.000.
Mannesmann Rexroth GmbH: *See*—
Kauss, Wolfgang, 4,960,035, Cl. 91-445.000.
Manning, Brenda D.: *See*—
Harvey, Michael A.; Manning, Brenda D.; Nicholson, Mary L.; Travis, Karen L.; and Luderer, Albert A., 4,960,716, Cl. 436-542.000.
Marconi Company Limited, The: *See*—
Gentles, Robert, 4,959,992, Cl. 73-10.00V.
Marelli, Luciano, to Elettro Plastica S.r.l. Delivery pump for fluid containers. 4,960,230, Cl. 222-321.000.
Marhold, Albrecht: *See*—
Kuhn, Rainer; Marhold, Albrecht; and Dicke, Hans-Rudolf, 4,960,539, Cl. 252-299.500.
Marin, Eric; and Le Comte, Marcel, to Institut Francais du Petrole. Method and device for improving the coefficient of transmission to geological formations of energy created by a well seismic source. 4,960,181, Cl. 181-106.000.
Marks, Robert J.; and Kupferschmidt, Albert, to Northern Telecom Limited. Grooming ring and grooming ring carrier. 4,960,394, Cl. 439-719.000.
Marlinga, Terrance C.: *See*—
Trudell, Gerald R.; and Marlinga, Terrance C., 4,959,984, Cl. 72-20.000.
Marquis, Edward T.: *See*—
Sanderson, John R.; and Marquis, Edward T., 4,960,948, Cl. 568-405.000.
Marshall, Gary R.: *See*—
Brooks, Ralf M.; Kallin, Fredrik L. N.; Marshall, Gary R.; and Reid, Bruce A., 4,960,336, Cl. 400-61.000.
Marshall, Robert M.: *See*—
Cordova, Colleen W.; and Marshall, Robert M., 4,960,431, Cl. 8-115.600.
Martelli, Daniele: *See*—
della Porta, Paolo; Martelli, Daniele; Urso, Giuseppe; and Trivellato, Stefano, 4,961,040, Cl. 313-561.000.
Martin, Dandy: *See*—
Guile, Donald L.; and Martin, Dandy, 4,960,737, Cl. 501-125.000.
Martin, Eric: *See*—
Hubert, Philippe; and Martin, Eric, 4,960,152, Cl. 137-559.000.
Martin, Gary K.: *See*—
Snorgrass, Patrick R.; and Martin, Gary K., 4,960,076, Cl. 119-29.000.
Martin, Harry F.: *See*—
Hargrove, Homer G.; Martin, Harry F.; and Whirlow, Donald K., 4,959,963, Cl. 60-646.000.
Martin, Jacob H.: *See*—
Browne, Fredrick D.; and Martin, Jacob H., 4,959,965, Cl. 62-129.000.
Martin, John, to S. C. Johnson & Son, Inc. Insect bait station. 4,959,924, Cl. 43-114.000.
Martin, Michael K.: *See*—
Willis, Carl L.; Conway, Michael F.; and Martin, Michael K., 4,960,831, Cl. 525-250.000.
Martin, Paul W., to Dresser Industries, Inc. Tube pulling device. 4,959,899, Cl. 29-726.000.
Martinson, Glen, to B.E.L-Tronics Limited. Multiband radar detector. 4,961,074, Cl. 342-20.000.
Maruhashi, Hideki: *See*—
Chiba, Masaaki; and Maruhashi, Hideki, 4,960,038, Cl. 92-98.00R.
Marui, Kuniyoshi; Ishii, Takaaki; and Takahashi, Shinya, to Kabushiki Kaisha Toshiba. Voice recognition system used in telephone apparatus. 4,961,212, Cl. 379-67.000.
Marumoto, Katsuji: *See*—
Abukawa, Toshimi; Okuyama, Toshiaki; Tahara, Kazuo; Marumoto, Katsuji; Koterazawa, Toshiyuki; Hombu, Mitsuyuki; Takahashi, Tadashi; Ishikura, Hisatugu; Yamamura, Hirohisa; Tatsuzaki, Toru; Omae, Tsutomu; and Takamatsu, Shuichi, 4,960,178, Cl. 180-79.100.
Maruyama, Kouji: *See*—
Murata, Masahide; Imai, Masafumi; Furuhashi, Hiroyuki; Maruyama, Kouji; and Ueno, Hiroshi, 4,960,743, Cl. 502-121.000.
Marxhausen, Joanne G. Method of aesthetically disguising a pillow. 4,959,879, Cl. 5-434.000.
Marziale, Michael L.; and Paradis, Stephen J. Acoustic leak detection system. 4,960,079, Cl. 122-504.200.
Masaki, Hiroya: *See*—
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Masaki, Kazumi, to Hayashibara, Ken. Device for low-frequency electrotherapy. 4,960,124, Cl. 128-421.000.
Masaki, Kazumi, to Hayashibara, Ken. Device for low-frequency electrotherapy in a humid environment. 4,960,125, Cl. 128-421.000.
Mashiko, Koichiro, to Mitsubishi Denki Kabushiki Kaisha. Semiconductor memory device with word lines adjacent and non-intersecting with capacitor grooves. 4,961,095, Cl. 357-23.600.
Masler, William F.: *See*—
Amjad, Zahid; and Masler, William F., 4,960,522, Cl. 210-701.000.
Mason, Howard B.: *See*—
Torbov, Tsvetan I.; and Mason, Howard B., 4,960,577, Cl. 423-242.000.
Massachusetts Institute of Technology: *See*—
Lele, Padmakar P., 4,960,109, Cl. 128-736.000.
MasterCard International, Inc.: *See*—
Elliott, John C.; O'Connell, James A.; Ladouceur, Lawrence; Altman, William; and Jarett, Keith, 4,961,142, Cl. 364-408.000.
Mastermatic, Inc.: *See*—
Pellicane, Jack E., 4,960,100, Cl. 126-21.00A.
Masuda, Isao: *See*—
Sageshima, Akira; Ozaki, Tadashi; Kawasaki, Hirozi; and Masuda, Isao, 4,960,194, Cl. 192-103.00B.
Masuda, Yoshitomo; Ogawa, Masao; Arai, Katsuhiko; Suzuki, Kinya; Fuse, Tadashi; and Amano, Tetsuro, to Bridgestone Corporation. Lithium cells. 4,960,657, Cl. 429-194.000.
Masugi, Takashi: *See*—
Takaya, Takao; Takasugi, Hisashi; Masugi, Takashi; Yamanaka, Hideaki; and Kawabata, Kohji, 4,960,889, Cl. 544-329.000.
Materazzi, Mario: *See*—
De Luca, Giovanna; Di Stazio, Giovanni; Materazzi, Mario; and Politi, Vincenzo, 4,960,759, Cl. 514-50.000.
Materna, William R., to Merkle Engineers, Inc. Self-positioning refractory structure. 4,960,058, Cl. 110-336.000.
Mathe, Denes: *See*—
Vedres, Andras; Szantay, Csaba; Stefko, Bela; Kreidl, Janos; Nemes, Andras; Blasko, Gabor; Bogsch, Erik; Mathe, Denes; Hegedus, Istvan; Szuchovszky, Adrien, nee Gergely; and Mester, Tamas, 4,960,888, Cl. 544-323.000.
Mathew, Abraham E.: *See*—
Stella, Valentino J.; and Mathew, Abraham E., 4,960,790, Cl. 514-449.000.
Mathews, Charlie V. Extendable torque bar. 4,960,015, Cl. 81-177.200.
MATRA: *See*—
de Givry, Jacques; Vallet, Jean C.; and Lalfer, Jean P., 4,959,900, Cl. 29-840.000.
Matrick, Howard: *See*—
Seibles, Josette C.; and Matrick, Howard, 4,960,677, Cl. 430-331.000.
Matsuda, Shinichi; Saito, Yoshio; and Ishizaka, Hideo, to Fuji Photo Film Co., Ltd. Refrigerator, dry air generating device for the same, and method for operating the device. 4,959,976, Cl. 62-271.000.
Matsuda, Shunsuke; Hioki, Yasuhiro; and Ueda, Masaaki, to Matsushita Electric Industrial Co., Ltd. Method of erasable recording and reading of information. 4,961,178, Cl. 369-103.000.
Matsumoto, Yoshiro; and Makihara, Akira, to Osaka Sanso Kogyo Ltd. Oxygen analyzer. 4,960,568, Cl. 422-83.000.
Matsumoto Yushi-Seiyaku Co., Ltd.: *See*—
Miura, Satoshi; Nishimura, Masato; Itoh, Shigeki; and Asari, Takashi, 4,960,749, Cl. 503-213.000.
Matsumura, Tetsuya; and Yoshimoto, Masahiko, to Mitsubishi Denki Kabushiki Kaisha. Method of and apparatus for generating variable time delay. 4,961,169, Cl. 365-189.120.
Matsumuto, Kazuaki: *See*—
Kosuga, Izumi; Otani, Kenichi; and Matsumuto, Kazuaki, 4,960,642, Cl. 428-407.000.
Matsuo, Masashi: *See*—
Miyazaki, Nobuyuki; Takayanagi, Takashi; and Matsuo, Masashi, 4,960,827, Cl. 525-131.000.
Matsuo, Toru: *See*—
Honkura, Yoshinobu; Nakashima, Yoshihiro; Matsuo, Toru; and Murata, Kouji, 4,960,470, Cl. 148-12.00E.
Matsushita Electric Industrial Co., Ltd.: *See*—
Ishino, Masato; and Sasai, Yoichi, 4,961,198, Cl. 372-50.000.
Matsuda, Shunsuke; Hioki, Yasuhiro; and Ueda, Masaaki, 4,961,178, Cl. 369-103.000.
Ogawa, Kazufumi, 4,960,722, Cl. 437-40.000.

Tanaka, Hideyuki; Saito, Koetsu; Sakai, Ikuo; and Kawabuchi, Masami, 4,961,176, Cl. 367-155.000.
Yoshinaka, Minoru; Asakura, Eizo; Oku, Mitsumasa; Hamabe, Takeshi; Kitano, Motoi; and Yoshida, Hideyuki, 4,960,654, Cl. 428-614.000.

Matsushita Electric Works, Ltd.: *See—*
Yamauchi, Kazumasa; Inoue, Hiromitsu; and Katayama, Susumu, 4,961,039, Cl. 340-554.000.

Mattox, Robert; and Fong, Steven, to Motorola, Inc. Method for forming a dielectric filled trench. 4,960,727, Cl. 437-67.000.

Matysek, James F.: *See—*
Wierszewski, Ronald R.; Scarlata, Richard F.; Acquaviva, Thomas; and Matysek, James F., 4,960,272, Cl. 271-3.100.

Maufe, Barry G.; and Young, Nicholas A., to EMI Limited. Signal generator. 4,961,203, Cl. 375-1.000.

Mauz, Lothar; and Gellner, Harald, to Daimler-Benz AG. Interlock device between an ignition lock and a manual selector lever for an automatic gear-change transmission. 4,959,982, Cl. 70-248.000.

Mavrakis, Stavros; and Cresci, Thomas R. Choke tube wrench for any gauge shotgun. 4,959,917, Cl. 42-90.000.

Maxfield, Blake T.: *See—*
Cranney, Don H.; and Maxfield, Blake T., 4,960,475, Cl. 149-2.000.

May & Baker Limited: *See—*
Ashton, Michael J.; Bridge, Andrew W.; Dron, Donald I.; Fenton, Garry; Lythgoe, David J.; Newton, Christopher G.; Riddell, David; Smith, Christopher; and Stuttle, Keith A. J., 4,960,775, Cl. 514-248.000.

May, Rodney E.: *See—*
Thelen, William G.; May, Rodney E.; and Gilbert, David L., 4,960,296, Cl. 285-50.000.

Mayall, Bruce I.: *See—*
Zowtiak, John M.; and Mayall, Bruce I., 4,960,708, Cl. 436-11.000.

Mayer, Emil. Glass block panel construction and device for use in same. 4,959,937, Cl. 52-308.000.

Mazda Motor Corporation: *See—*
Shigenaka, Makoto, 4,960,969, Cl. 219-91.200.
Shigenaka, Makoto, 4,960,974, Cl. 219-137.00R.

Mazziotti, Philip J., to Zeller Corporation, The. Support for rotatably supporting a shaft. 4,960,334, Cl. 384-486.000.

McCloskey, Ralph J.: *See—*
Deysarkar, Asoke K.; and McCloskey, Ralph J., 4,959,995, Cl. 73-54.000.

McDaniel, Max P.: *See—*
Klendworth, Douglas D.; and McDaniel, Max P., 4,960,748, Cl. 502-210.000.

McDonald, Frank W., to Black Photo Corporation. Photo-processing device. 4,961,093, Cl. 355-29.000.

McDougal, John A.; and Lennington, John W., to McDougal, John A. Internal combustion engine ignition system and cleaning device. 4,960,093, Cl. 123-416.000.

McDowell, Harvey R.; and Blew, Douglas J., to Siecor Corporation. Aerial cable installation method. 4,960,266, Cl. 254-134.3PA.

McElfresh, Mark W., to Drackett Company, The. Air freshener with integral tear-away tab. 4,960,240, Cl. 239-56.000.

McEnearney, Paul. Fluid restricting valve. 4,960,260, Cl. 251-127.000.

McGee, Nancy: *See—*
Wolens, John; and McGee, Nancy, 4,959,911, Cl. 34-237.000.

McGraw, Brian J.: *See—*
Jordan, Willie W.; and McGraw, Brian J., 4,960,219, Cl. 215-354.000.

McKean, Ronald A.; and Stiegman, Jeff, to KMS Fusion, Inc. Scanning and storage of electrophoretic records. 4,960,999, Cl. 250-461.100.

McLeod, Robert; Card, Howard; Hortensius, Peter; and Pries, Werner, to University of Manitoba. Cellular automaton for generating random data. 4,961,159, Cl. 364-717.000.

McMahon, Donald H.: *See—*
Liebenrood, John D.; and McMahon, Donald H., 4,960,989, Cl. 250-227.150.

McMahon, Michael E.: *See—*
Gordon, Julian; McMahon, Michael E.; and Ching, Shanfun, 4,960,691, Cl. 435-6.000.

McNeil, John R.: *See—*
Collins, George J.; McNeil, John R.; and Yu, Zeng-gi, 4,960,753, Cl. 505-1.000.

McNeil-PPC, Inc.: *See—*
Mesek, Frederick K., 4,960,477, Cl. 156-209.000.

McNeilab, Inc.: *See—*
Carson, John R., 4,960,798, Cl. 514-654.000.

McNeill, Harry L., to Colorado School of Mines. Ore flotation device and process. 4,960,509, Cl. 209-164.000.

Mead Corporation, The: *See—*
Hammann, William A., IV; Liang, Rong-Chang; Thomas, Teresa M.; and Hipps, Jesse, Sr., 4,960,750, Cl. 503-214.000.
Spamer, William S., 4,960,210, Cl. 211-59.200.

Mechtersheimer, Gunter, to Asea Brown Boveri Ltd. Ozone generator. 4,960,570, Cl. 422-186.210.

Meckler, Gershon. Air conditioning apparatus. 4,959,970, Cl. 62-176.100.

Medtronic Versaflex, Inc.: *See—*
Buchbinder, Maurice, 4,960,411, Cl. 604-95.000.

Mee, William: *See—*
Benton, William M.; and Mee, William, 4,960,981, Cl. 235-379.000.

Meguro, Hidenori: *See—*
Seki, Masaki; Samukawa, Koji; and Meguro, Hidenori, 4,961,041, Cl. 318-578.000.

Mehrotra, Pankaj K.; and Billman, Elizabeth R., to Kennametal Inc. Alumina-zircoma-silicon carbide-magnesia ceramics. 4,960,735, Cl. 501-89.000.

Melzer, Jaroslav, to BASF Aktiengesellschaft. Separating sheetlike structures from piles. 4,960,361, Cl. 414-786.000.

Menke, James C.: *See—*
Rao, Bhaskara M. L.; Menke, James C.; and Hamlen, Robert P., 4,959,919, Cl. 43-17.600.

Mentor Corporation: *See—*
Yan, John Y. J.; and Purkait, Bobby K., 4,960,425, Cl. 623-8.000.

Mepaco, Inc.: *See—*
Pierce, Christopher R., 4,960,200, Cl. 198-495.000.

Merck & Co., Inc.: *See—*
Currie, Sara A.; Miller, Thomas W.; Dulaney, Eugene L.; Springer, James P.; Valiant, Mary E.; del Val, Sagrario M.; and Zimmerman, Sheldon B., 4,960,698, Cl. 435-119.000.
Garcia, Maria; and Gimenez-Gallego, Guillermo, 4,960,867, Cl. 530-324.000.

Merck Patent GmbH: *See—*
Reinmuller, Johannes, 4,960,415, Cl. 604-890.100.

Merckle GmbH: *See—*
Metz, Gunter; Rauchle, Kurt; and Erdmann, Manfred, 4,960,793, Cl. 514-532.000.

Merkle Engineers, Inc.: *See—*
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Merrell Dow Pharmaceuticals Inc.: *See—*
Salituro, Francesco G.; Harrison, Boyd L.; and Baron, Bruce M., 4,960,786, Cl. 514-419.000.

Mesek, Frederick K., to McNeil-PPC, Inc. Disposable diaper with folded absorbent batt. 4,960,477, Cl. 156-209.000.

Messerschmitt-Boelkow-Blohm GmbH: *See—*
Huetter, Horst, 4,960,032, Cl. 89-1.510.

Messerschmitt-Bolkow-Blohm GmbH: *See—*
Littke, Walter; and Schoen, Erhard, 4,960,572, Cl. 422-245.000.

Mestas, Gilbert L.; and Mestas, Joseph G., Jr. Land anchor for a boat. 4,960,064, Cl. 114-230.000.

Mestas, Joseph G., Jr.: *See—*
Mestas, Gilbert L.; and Mestas, Joseph G., Jr., 4,960,064, Cl. 114-230.000.

Mester, Tamas: *See—*
Vedres, Andras; Szantay, Csaba; Stefko, Bela; Kreidl, Janos; Nemes, Andras; Blasko, Gabor; Bogsch, Erik; Mathe, Denes; Hegedus, Istvan; Szuchovszky, Adrien, nee Gergely; and Mester, Tamas, 4,960,888, Cl. 544-323.000.

Metrick, Dennis: *See—*
Greenway, John M.; Schortmann, Walter E.; Mancini, Peter; Metrick, Dennis; and Connolly, Timothy, 4,960,630, Cl. 428-131.000.

Metrologic Instruments, Inc.: *See—*
Knowles, Carl H., 4,960,985, Cl. 235-467.000.

Metz, Gunter; Rauchle, Kurt; and Erdmann, Manfred, to Merckle GmbH. Diethylene glycol monoester derivatives, compositions and therapeutic use. 4,960,793, Cl. 514-532.000.

Meyer Machine Company: *See—*
Lassiter, Jimmie F., Jr.; and Slager, David R., 4,960,199, Cl. 198-494.000.

Meyer, Rolf-Volker: *See—*
Kohler, Burkhard; and Meyer, Rolf-Volker, 4,960,855, Cl. 528-211.000.

Meyer, Sandra L. Training pants. 4,960,414, Cl. 604-395.000.

Meysen, Fried, executor: *See—*
Obrist, Frank; Wankel, Felix H., deceased; Renz, Gerhard, executor; Meysen, Fried, executor; and Burkhardt, Thomas, executor, 4,960,370, Cl. 418-9.000.

Michigan Technological University, Board of Control: *See—*
DeBruine, Gordon R.; Haataja, Bruce A.; and Sandberg, L. Bogue, 4,960,553, Cl. 264-113.000.

Midgley, Christian G.: *See—*
Gilliland, W. Keith; Midgley, Christian G.; Dana, Francis W.; and Mutch, Mark C., 4,961,088, Cl. 355-206.000.

Midwest Research Institute: *See—*
Tsuo, Y. Simon; and Deb, Satyen K., 4,960,675, Cl. 430-311.000.

Mijac, Marko D.: *See—*
Talkington, Sherry R.; Abe, Susan S.; and Mijac, Marko D., 4,960,602, Cl. 426-534.000.

Mikakto Precision Engineering Research Institute Co., Ltd.: *See—*
Mori, Yuzo; and Yamauchi, Kazuto, 4,960,495, Cl. 204-129.300.

Mikami, Emiko: *See—*
Takematsu, Tetsuo; Yoneyama, Kouichi; Jikihara, Tetsuo; Katsurada, Manabu; Shike, Toyohiko; Hosokawa, Akemi; Mikami, Emiko; and Ikeda, Osamu, 4,960,897, Cl. 546-346.000.

Mikami, Takashi: *See—*
Komatsu, Masato; Isoi, Masaaki; Baba, Isao; and Mikami, Takashi, 4,960,823, Cl. 525-89.000.

Mikashima, Hiroshi: *See—*
Moriwaki, Minoru; Abe, Masao; Mikashima, Hiroshi; and Tahara, Tetsuya, 4,960,770, Cl. 514-219.000.

Miles Inc.: *See—*
Lau, Arthur L., 4,960,710, Cl. 436-86.000.

Millager, Richard J., to Esco Corporation. Method of reclaiming foundry sand. 4,960,162, Cl. 164-5.000.

Miller, Kevin P.: *See—*
Farbood, Mohamad I.; Morris, James A.; Sprecker, Mark A.; Bienkowski, Lynda J.; Miller, Kevin P.; Vock, Manfred H.; and Hagedorn, Myrna L., 4,960,597, Cl. 426-3.000.

Miller, Thomas W.: *See*—
Currie, Sara A.; Miller, Thomas W.; Dulaney, Eugene L.; Springer, James P.; Valiant, Mary E.; del Val, Sagrario M.; and Zimmerman, Sheldon B., 4,960,698, Cl. 435-119.000.
Miller, William: *See*—
Woodward, Bruce; and Miller, William, 4,960,184, Cl. 181-287.000.
Millet, Jean: *See*—
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Milligan, John: *See*—
Muhl, Laszlo A.; Omori, Thomas I.; and Milligan, John, 4,960,803, Cl. 521-106.000.
Milner, Richard, to Smith and Nephew Associated Companies p.l.c. Orthopaedic splinting material. 4,960,116, Cl. 128-90.000.
Milner, Steven S.: *See*—
Haun, Edward C.; Milner, Steven S.; and Lomas, David A., 4,960,503, Cl. 208-85.000.
Mimura, Munehiko; Tatumi, Takumi; Naito, Yasuo; and Katayama, Kazuyori, to Mitsubishi Denki Kabushiki Kaisha. Constant speed holding apparatus. 4,960,182, Cl. 180-179.000.
Mimura, Takashi; and Fujisawa, Nobuhiko, to Ryobi Ltd. Offset printing machine having two printing units. 4,960,049, Cl. 101-217.000.
Mimura, Takashi: *See*—
Kuroda, Shigeru; Mimura, Takashi; and Notomi, Seishi, 4,961,194, Cl. 357-22.000.
Minami, Kouji: *See*—
Yamaoki, Toshihiko; Wakisaka, Kenichiro; Minami, Kouji; and Iwamoto, Masayuki, 4,961,094, Cl. 355-326.000.
Minami, Ryohei, to Sumitomo Metal Industries, Ltd. Method for the preparation of naphthoquinone. 4,960,914, Cl. 552-296.000.
Minami, Shuji: *See*—
Kinoshita, Tatsuo; Minami, Shuji; and Kanzaki, Shigeru, 4,960,875, Cl. 585-10.000.
Minari, Katsunobu, to Hoshizaki Electric Co., Ltd. Refrigerant piping system for refrigeration equipment. 4,959,971, Cl. 62-197.000.
Minderhoud, Johannes K.; and Lucien, Jacques, to Shell Oil Company. Process for the hydrogenation of hydrocarbon oils. 4,960,505, Cl. 208-143.000.
Mine, Takayuki: *See*—
Kawabata, Juheiji; Chiba, Manabu; Sugie, Toshinori; Kobata, Fumihiro; Izutsu, Hitoshi; Inoue, Toshio; and Mine, Takayuki, 4,960,841, Cl. 525-537.000.
Miner Enterprises, Inc.: *See*—
Carlstedt, Richard A., 4,960,215, Cl. 213-33.000.
Minker, Emil: *See*—
Korbonits, Dezso ; Heja, Gergely; Szomor, Maria; and Minker, Emil, 4,960,773, Cl. 514-234.210.
Minnesota Mining and Manufacturing Company: *See*—
Berg, James G.; and Reylek, Robert S., 4,960,490, Cl. 156-656.000.
Sorlien, Mark D., 4,960,481, Cl. 156-272.400.
Minolta Camera Kabushiki Kaisha: *See*—
Nakasa, Masayuki; Ishikawa, Norio; and Hosomizu, Hiroshi, 4,961,083, Cl. 354-145.100.
Miranda Investments Limited: *See*—
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Misawa, Yozi: *See*—
Sekiguchi, Hideo; Mitoh, Yasuo; and Misawa, Yozi, 4,960,268, Cl. 269-43.000.
Mishra, Umeshwar D.: *See*—
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Mitoh, Yasuo: *See*—
Sekiguchi, Hideo; Mitoh, Yasuo; and Misawa, Yozi, 4,960,268, Cl. 269-43.000.
Mitsubishi Chemical Industries Inc.: *See*—
Hihara, Toshio; and Shimizu, Yukiharu, 4,960,871, Cl. 534-635.000.
Mitsubishi Denki Kabushiki Kaisha: *See*—
Akasu, Masahira, 4,959,996, Cl. 73-116.000.
Chiba, Masaaki; and Maruhashi, Hideki, 4,960,038, Cl. 92-98.00R.
Honda, Takenobu, 4,960,186, Cl. 187-20.000.
Ikeno, Masahiko; and Saeki, Hideo, 4,960,658, Cl. 430-7.000.
Inoue, Takesi, 4,960,983, Cl. 235-449.000.
Kajiwara, Yasuya, 4,961,146, Cl. 364-426.040.
Kakimoto, Syoichi, 4,960,730, Cl. 437-129.000.
Kakino, Yoshiaki; Ihara, Yukitoshi; Yonetani, Mitsuo; and Teshima, Takeo, 4,961,034, Cl. 318-600.000.
Komurasaki, Satosi, 4,959,993, Cl. 73-35.000.
Kumanoya, Masaki; Konishi, Yasuhiro; Dosaka, Katsumi; Komatsu, Takahiro; and Tobita, Youichi, 4,961,007, Cl. 307-296.200.
Kumanoya, Masaki; Konishi, Yasuhiro; Dosaka, Katsumi; Komatsu, Takahiro; and Inoue, Yoshinori, 4,961,167, Cl. 365-189.090.
Mashiko, Koichiro, 4,961,095, Cl. 357-23.600.
Matsumura, Tetsuya; and Yoshimoto, Masahiko, 4,961,169, Cl. 365-189.120.
Mimura, Munehiko; Tatumi, Takumi; Naito, Yasuo; and Katayama, Kazuyori, 4,960,182, Cl. 180-179.000.
Nakagawa, Shin-ichi; and Terane, Hideyuki, 4,961,191, Cl. 371-22.100.
Nishitani, Kazuharu, 4,961,012, Cl. 307-465.000.
Sekikawa, Katsuhide, 4,961,072, Cl. 340-731.000.
Tada, Tetsuo; Takagi, Ryoichi; and Kohara, Masanobu, 4,961,052, Cl. 324-158.00P.
Takahira, Kenichi, 4,960,982, Cl. 235-382.000.
Ueda, Takaharu; Yamamoto, Tetsu; Ogura, Manabu; and Yumura, Takashi, 4,961,118, Cl. 358-497.000.
Mitsubishi Jukogyo Kabushiki Kaisha: *See*—
Kanehara, Koichi; and Fukuda, Kazumi, 4,960,196, Cl. 194-215.000.
Mitsubishi Kasei Corporation: *See*—
Takematsu, Tetsuo; Yoneyama, Kouichi; Jikihara, Tetsuo; Katsurada, Manabu; Shike, Toyohiko; Hosokawa, Akemi; Mikami, Emiko; and Ikeda, Osamu, 4,960,897, Cl. 546-346.000.
Yoshitomi, Toshihiko; Yushina, Heihachi; Horiuchi, Hiromi; Yamaguchi, Yukio; Kamoshita, Yasuo; and Sekihara, Kiyoshi, 4,960,668, Cl. 430-122.000.
Mitsubishi Petrochemical Co., Ltd.: *See*—
Kanekiyo, Takazumi, 4,960,541, Cl. 252-546.000.
Mitsui Petrochemical Industries, Ltd.: *See*—
Imamura, Tetsuo; Shirahata, Tatsuo; and Shoji, Kichiro, 4,960,958, Cl. 568-806.000.
Kinoshita, Tatsuo; Minami, Shuji; and Kanzaki, Shigeru, 4,960,875, Cl. 585-10.000.
Toibana, Hisaharu; Kuroiwa, Mitsuyuki; and Todo, Akira, 4,960,627, Cl. 428-64.000.
Mitsui Toatsu Chemicals, Inc: *See*—
Itoh, Hisato; Oguchi, Takahisa; Enomoto, Katashi; Nakatsuka, Masakatsu; and Nishizawa, Tsutomu, 4,960,538, Cl. 252-299.200.
Mitsui Toatsu Chemicals, Inc.: *See*—
Harada, Isao; Yoda, Yukihiro; Iwanaga, Naruyuki; Nishitsuji, Toshihiko; and Kikkawa, Akio, 4,960,581, Cl. 423-489.000.
Yamaya, Norimasa; Koga, Nobuhito; Ohta, Masahiro; and Yamaguchi, Akihiro, 4,960,852, Cl. 528-170.000.
Miura, Satoshi; Nishimura, Masato; Itoh, Shigeki; and Asari, Takashi, to Matsumoto Yushi-Seiyaku Co., Ltd. Set for producing a colored pattern. 4,960,749, Cl. 503-213.000.
Miwon Co., Ltd.: *See*—
Kim, Jong S.; Han, Min S.; Lim, Bun S.; Lee, Gae C.; and Lee, Seung T., 4,960,930, Cl. 562-443.000.
Miyai, Kenzi: *See*—
Takaya, Takao; Sakane, Kazuo; Miyai, Kenzi; and Kawabata, Kohji, 4,960,766, Cl. 514-202.000.
Miyaoka, Shuuichi; Odaka, Masanori; Higuchi, Hiroshi; and Arai, Toshikazu, to Hitachi, Ltd.; Hitachi Microcomputer Engineering; and Akita Electronics, Co., Ltd. Semiconductor memory device with dual selection circuitry including CMOS and bipolar transistors. 4,961,164, Cl. 365-177.000.
Miyashita, Yukio: *See*—
Koike, Yuzuru; Miyashita, Yukio; Akimoto, Yoshiaki; Seki, Yasunari; and Yahata, Isao, 4,960,094, Cl. 123-425.000.
Miyazaki, Nobuyuki; Takayanagi, Takashi; and Matsuo, Masashi, to Asahi Glass Company, Ltd. Curable resin composition. 4,960,827, Cl. 525-131.000.
Miyoshi, Noriaki: *See*—
Kakinoki, Wataru; Miyoshi, Noriaki; and Arai, Koji, 4,961,017, Cl. 310-71.000.
Mizoguchi, Yukio: *See*—
Ohshita, Takahiro; Higo, Tsutomu; and Mizoguchi, Yukio, 4,960,057, Cl. 110-345.000.
Mizuno, Tetsuya: *See*—
Sonoi, Takehiro; Sagawa, Toshimasa; Yamada, Okimasa; and Mizuno, Tetsuya, 4,960,947, Cl. 508-399.000.
Mizuno, Toshiya: *See*—
Satake, Yoshikatsu; Yamamoto, Shinji; Kaneko, Takashi; Tada, Masahito; Kashiwadate, Ken; Mizuno, Toshiya; Endo, Hiroyuki; Katto, Takayuki; and Shiiki, Zenya, 4,960,555, Cl. 264-288.400.
Satake, Yoshikatsu; Yamamoto, Shinji; Kaneko, Takashi; Tada, Masahito; Kashiwadate, Ken; Mizuno, Toshiya; Endo, Hiroyuki; Katto, Takayuki; and Shiiki, Zenya, 4,960,806, Cl. 524-100.000.
Mizus, Irving. Endotracheal tube replacement obturator. 4,960,122, Cl. 128-207.140.
Mizushima, Hiroshi: *See*—
Iizuka, Shigeo; Kishi, Takao; Ogawa, Riichi; and Mizushima, Hiroshi, 4,960,339, Cl. 401-129.000.
Moba-Electronic Gesellscharft fur Mobil-Automation mbH: *See*—
Sehr, Willibald; and Zarniko, Martin, 4,961,173, Cl. 367-96.000.
Mobay Corporation: *See*—
Doerge, Herman P., 4,960,804, Cl. 521-130.000.
Nodelman, Neil H., 4,960,537, Cl. 252-182.280.
Mobil Oil Corporation: *See*—
Horodysky, Andrew G.; and Wu, Shi-Ming, 4,960,529, Cl. 252-32.500.
Johnson, Ivy D., 4,960,745, Cl. 502-150.000.
Mochida, Ei, to Mochida Pharmaceutical Co., Ltd. Chemical reaction apparatus. 4,960,566, Cl. 422-65.000.
Mochida Pharmaceutical Co., Ltd.: *See*—
Mochida, Ei, 4,960,566, Cl. 422-65.000.
Mochiji, Kozo; Oizumi, Hiroaki; Soda, Yasunari; and Kimura, Takeshi, to Hitachi, Ltd. Method for forming pattern by using graft copolymerization. 4,960,676, Cl. 430-326.000.
Mochizuki, Noriya: *See*—
Komatsuzaki, Hiroshi; Kamata, Kazuo; Ohmiya, Akio; Nishimura, Syunji; Umeda, Yoshihito; Mochizuki, Noriya; and Furuya, Eiji, 4,961,084, Cl. 354-268.000.
Mochizuki, Satoru: *See*—
Okamoto, Hiroshi; Fushimi, Kimio; Mochizuki, Satoru; and Ootuka, Yoshio, 4,959,969, Cl. 62-157.000.
Modien Manufacturing Co.: *See*—
Granetzke, Dennis, 4,960,169, Cl. 165-173.000.
Moffet, Frank W., Jr. Growing medium for plants. 4,959,926, Cl. 47-59.000.

Mohrmann, Karl H.: *See*—
Zerbes, Rudolf; Linke, Siegfried W.; Mohrmann, Karl H.; and Reiser, Wolf, 4,960,911, Cl. 549-519.000.
Moisson, Rene : *See*—
Gillonnier, Claude; and Moisson, Rene , 4,960,932, Cl. 562-559.000.
Molex Incorporated: *See*—
Stanevich, Kenneth W., 4,960,386, Cl. 439-326.000.
MOLTECH Invent S.A.: *See*—
Nguyen, Thinn; Lazouni, Abdelkrim; and Doan, Kim S., 4,960,494, Cl. 204-67.000.
Molteni, Giuseppe; Nicora, Carlo; Cesaro, Attilio; and Pricl, Sabrina, to Fratelli Lamberti S.p.A. Modified galactomannans and process for their preparation. 4,960,876, Cl. 536-114.000.
Monckton, Susan P.: *See*—
Trecker, Gary W.; and Monckton, Susan P., 4,960,605, Cl. 426-582.000.
Moncrief, Rick L.; and Durfey, Erik J., to Atari Games Corporation. Rear entry booth and seat for a sit-down video game. 4,960,117, Cl. 273-148.00B.
Moneyfax, Inc.: *See*—
Benton, William M.; and Mee, William, 4,960,981, Cl. 235-379.000.
Monrose, Russell J., to British Gas plc. Device for permitting a first length of previously commissioned main to be extended by connecting a second length of main thereto. 4,960,155, Cl. 138-178.000.
Monteleone, Michael G.: *See*—
Wilson, Richard A.; Zampino, Michael J.; Mookherjee, Braja D.; Trenkle, Robert W.; Van Ouwerkerk, Anton; Hagedorn, Myrna L.; and Monteleone, Michael G., 4,960,754, Cl. 512-25.000.
Mookherjee, Braja D.: *See*—
Wilson, Richard A.; Zampino, Michael J.; Mookherjee, Braja D.; Trenkle, Robert W.; Van Ouwerkerk, Anton; Hagedorn, Myrna L.; and Monteleone, Michael G., 4,960,754, Cl. 512-25.000.
Moon, Theodore L. Limb protector device. 4,959,875, Cl. 2-22.000.
Moore, James H., to General Electric Company. Turning gear engagement device. 4,960,006, Cl. 74-384.000.
Moore, Marvin J., Jr. Safety device for chain saws. 4,959,906, Cl. 30-381.000.
Moore, Richard B. Headed fastener retainer clip. 4,960,354, Cl. 411-523.000.
Moore, Zack J. Apparatus for measuring the electric charge condition of non-conductive particles in a liquid medium. 4,961,147, Cl. 324-446.000.
Moos, Walter H., to Warner-Lambert Company. Isotopically-labeled polycyclic amine derivatives. 4,960,815, Cl. 424-1.100.
Morchower, Harry S., to Dallas Handbag Company. Carrying bag assembly. 4,960,233, Cl. 224-250.000.
Mori, Hideshi: *See*—
Kato, Hisaaki; Yamaguchi, Hiroshi; Mori, Hideshi; and Shimano, Akira, 4,959,952, Cl. 57-261.000.
Mori, Hiromi; and Morimoto, Reiko, to Canon Kabushiki Kaisha. Process for producing toner by generating non-soluble cationic inorganic particles in dispersant medium. 4,960,669, Cl. 430-137.000.
Mori, Shigeki, to Murata Kikai Kabushiki Kaisha. Yarn guide device for a two-for-one twister. 4,959,951, Cl. 57-58.520.
Mori, Shigeru: *See*—
Sakuta, Koji; Kuwata, Satoshi; and Mori, Shigeru, 4,960,898, Cl. 548-110.000.
Mori, Sumio: *See*—
Suzuki, Yasuhiro; Mori, Sumio; Fujiyama, Eiji; and Sasaki, Masami, 4,960,073, Cl. 118-723.000.
Mori, Yuzo; and Yamauchi, Kazuto, to Mikakto Precision Engineering Research Institute Co., Ltd. Process for precise processing of workpiece using free radicals. 4,960,495, Cl. 204-129.300.
Morikawa, Juichi: *See*—
Sakai, Kazuo; Terayama, Takao; and Morikawa, Juichi, 4,961,122, Cl. 360-107.000.
Morimoto, Reiko: *See*—
Mori, Hiromi; and Morimoto, Reiko, 4,960,669, Cl. 430-137.000.
Morini, Marco. Device for feeding a carburation engine in special operating conditions. 4,960,545, Cl. 261-41.500.
Morita, Hiroyuki: *See*—
Orii, Akira; and Morita, Hiroyuki, 4,961,037, Cl. 318-696.000.
Morita, Tadaaki: *See*—
Sukimoto, Minobu; Akiyoshi, Hitoshi; Taguchi, Seijiro; and Morita, Tadaaki, 4,960,096, Cl. 123-570.000.
Moritani, Tohei: *See*—
Oda, Hidemasa; Moritani, Tohei; Hirofuji, Satoshi; and Okuno, Kenji, 4,960,639, Cl. 428-34.500.
Moriwaki, Minoru; Abe, Masao; Mikashima, Hiroshi; and Tahara, Tetsuya, to Yoshitomi Pharmaceutical Industries, Ltd. 2-alkyl thieno(triazolo)diazepine compounds and pharmaceutical uses thereof. 4,960,770, Cl. 514-219.000.
Moriya, Koichi: *See*—
Shiokawa, Kozo; Tsuboi, Shinichi; Sasaki, Shoko; Moriya, Koichi; Hattori, Yumi; and Shibuya, Katsuhiko, 4,960,780, Cl. 514-300.000.
Moriyama, Norio: *See*—
Shimada, Junichi; Kobayashi, Kazutoshi; Moriyama, Norio; and Kawakami, Kazuhiko, 4,960,099, Cl. 123-647.000.
Moroi, Masayuki, to Texas Instruments Incorporated. Semiconductor wafer pick-up device. 4,960,298, Cl. 294-64.100.
Morris, Antone W. Earthquake safety valve. 4,960,146, Cl. 137-39.000.
Morris, James A.: *See*—
Farbood, Mohamad I.; Morris, James A.; Sprecker, Mark A.; Bienkowski, Lynda J.; Miller, Kevin P.; Vock, Manfred H.; and Hagedorn, Myrna L., 4,960,597, Cl. 426-3.000.
Morris, Robert H. Combined mass flow/pitot tube meter. 4,959,990, Cl. 73-202.000.
Morser, Michael J.: *See*—
Rice, Craig; Morser, Michael J.; Glaser, Charles; and Donner, Peter A., 4,960,702, Cl. 435-226.000.
Mosbach, Klaus: *See*—
Sellergren, Borje; Ekberg, Bjorn A.; Albertsson, Per-Ake; and Mosbach, Klaus, 4,960,762, Cl. 514-57.000.
Moss, Gaylord E.; and Wreede, John E., to Hughes Aircraft Company. Holographic exposure system for computer generated holograms. 4,960,311, Cl. 350-3.660.
Mosser, Benjamin H., III: *See*—
Frantz, Robert H.; Mosser, Benjamin H., III; Myers, Earl C., Jr.; and Reynolds, Charles E., 4,960,388, Cl. 439-404.000.
Frantz, Robert H.; Mosser, Benjamin H., III; Myers, Earl C., Jr.; and Reynolds, Charles E., 4,960,389, Cl. 439-404.000.
Motan Verfahrungstechnik GmbH & Co.: *See*—
Reif, Werner, 4,959,947, Cl. 53-502.000.
Motika, Stephen A.: *See*—
Carroll, W. Eamon; and Motika, Stephen A., 4,960,862, Cl. 528-405.000.
Motorola, Inc.: *See*—
Davies, Robert B., 4,960,723, Cl. 437-41.000.
Drapac, George; Woltz, Stephen H.; and Oliboni, Mark L., 4,961,073, Cl. 340-825.440.
Geist, Henry E.; and Segerson, Eugene E., 4,961,107, Cl. 357-81.000.
Gray, Randall C.; and Edwards, Arthur, 4,961,045, Cl. 323-273.000.
Maher, John W.; Mulford, Keith I.; and Tykal, James C., 4,961,070, Cl. 340-721.000.
Mattox, Robert; and Fong, Steven, 4,960,727, Cl. 437-67.000.
Pace, Gary L.; and Overton, David H., 4,961,006, Cl. 307-270.000.
Pirastehfar, Hassan; Onodera, George C.; Law, Waisiu; and Heminger, David M., 4,961,097, Cl. 357-30.000.
Sigmon, Bernard E., 4,961,058, Cl. 331-9.000.
Suzuki, Minoru, 4,961,067, Cl. 340-146.200.
Mototake, Tatsuya; Outou, Tatsuyuki; Yamamoto, Yoshinori; and Kawakami, Kenji, to Sony Corporation. Recording and/or reproducing apparatus with rotary head for magnetic tape cassette. 4,961,120, Cl. 360-85.000.
Mottine, John J., Jr.: *See*—
Dentini, Mark S.; Fulton, Joe A.; Jin, Sungho; Mottine, John J., Jr.; Shepherd, Lloyd; and Sherwood, Richard C., 4,960,612, Cl. 427-47.000.
Mozsolics, Karoly: *See*—
Ecsery, Zoltan, deceased; Knoll, Jozsef; Somfai, Eva; Torok, Zoltan; Szinnyei, Eva; and Mozsolics, Karoly, 4,960,797, Cl. 514-654.000.
Mucha, John A.: *See*—
Chang, Chorng-Ping; Flamm, Daniel L.; Ibbotson, Dale E.; and Mucha, John A., 4,960,656, Cl. 428-704.000.
Mueller, Michael W.; Hoppe, Kalus-Dieter; Schwab, Ekkehard; Steck, Werner; Auweter, Helmut; and Feser, Rainer, to BASF Aktiengesellschaft. Acicular, ferromagnetic metal particles essentially consisting of iron, and their preparation. 4,960,462, Cl. 75-252.000.
Mueller, Otward M.: *See*—
Park, John N.; Mueller, Otward M.; and Roemer, Peter B., 4,961,054, Cl. 324-322.000.
Muessli, Daniel, to Skyline Holding AG. Discharge lamp having a standardized base. 4,961,027, Cl. 315-58.000.
Muhl, Laszlo A.; Omori, Thomas I.; and Milligan, John. Fire retardant foam materials. 4,960,803, Cl. 521-106.000.
Muhlberger, Reinhard: *See*—
Stritzl, Karl; Hoffmann, Kurt; Freisinger, Henry; Janisch, Andreas; Brunnhuber, Egon; Zotter, Johann; Spitaler, Egelbert; Wladar, Helmut; Muhlberger, Reinhard; and Dapeci, Karl, 4,960,289, Cl. 280-630.000.
Mukai, Toshio; Yamashita, Yoshiro; and Suzuki, Takanori, to Fuji Xerox Co., Ltd.; and Toshio Mukai. Charge transfer complex formed between benzoquinone derivative and electron donor and process for producing the same. 4,960,886, Cl. 544-35.000.
Mukoyoshi, Shunichiro; Yamori, Tsunefumi; Shuku, Shigekazu; and Fujioka, Hironari, to Kanzaki Paper Manufacturing Co., Ltd. Recording sheet. 4,960,638, Cl. 428-342.000.
Mulford, Keith I.: *See*—
Maher, John W.; Mulford, Keith I.; and Tykal, James C., 4,961,070, Cl. 340-721.000.
Muller, Hans C.; and Schopp, Richard, to Teldix GmbH. Drive and locking system. 4,960,010, Cl. 74-640.000.
Muller, Johannes J.: *See*—
Van Putte, Karel P.; and Muller, Johannes J., 4,960,544, Cl. 260-420.000.
Muller, Jurgen; Schmidt, Manfred; Wauer, Dieter; Zehetmaier, Thomas; Brys, Georges; Schoeters, Emile; Haug, Werner; and Bauer, Walter, to Agfa-Gevaert AG. X-ray cassette for sheet x-ray receiving material and method of processing the same. 4,960,994, Cl. 250-327.200.
Multicore Solders Limited: *See*—
Hedges, Philip S.; and Rubin, Wallace, 4,960,236, Cl. 228-180.100.
Murahashi, Mamoru: *See*—
Takata, Susumu; and Murahashi, Mamoru, 4,960,649, Cl. 428-574.000.
Murasa International: *See*—
Simms, Robert A., 4,960,988, Cl. 250-213.0VT.

Murata Kikai Kabushiki Kaisha: *See—*
Kato, Hisaaki; Yamaguchi, Hiroshi; Mori, Hideshi; and Shimano, Akira, 4,959,952, Cl. 57-261.000.
Mori, Shigeki, 4,959,951, Cl. 57-58.520.

Murata, Kouji: *See—*
Honkura, Yoshinobu; Nakashima, Yoshihiro; Matsuo, Toru; and Murata, Kouji, 4,960,470, Cl. 148-12.00E.

Murata Manufacturing Co., Ltd.: *See—*
Yamaguchi, Masami; and Arishiro, Masatoshi, 4,960,195, Cl. 193-44.000.

Murata, Masahide; Imai, Masafumi; Furuhashi, Hiroyuki; Maruyama, Kouji; and Ueno, Hiroshi, to Toa Nenryo Kogyo K.K. Method for production of catalyst carrier for polymerization of olefin. 4,960,743, Cl. 502-121.000.

Murata, Noboru: *See—*
Eonomoto, Takamitsu; Ueda, Hiroshi; Kawahara, Midori; Okada, Naoki; and Murata, Noboru, 4,960,551, Cl. 264-65.000.

Murray, Ellen E. Cleaning mitt. 4,959,881, Cl. 15-227.000.

Muschalik, Gerald; and Hahn, Winfried, to VDO Adolf Schindling AG. Load-shifting device intended for an internal combustion engine. 4,960,090, Cl. 123-399.000.

Musser, John H.: *See—*
Kreft, Anthony F., III; Musser, John H.; Bickaler, James J.; Giberson, John W.; and Kubrak, Dennis M., 4,960,892, Cl. 546-152.000.

Mutch, Mark C.: *See—*
Gilliland, W. Keith; Midgley, Christian G.; Dana, Francis W.; and Mutch, Mark C., 4,961,088, Cl. 355-206.000.

Mycom Kabushiki Kaisha: *See—*
Arikawa, Haruhiko, 4,961,036, Cl. 318-603.000.

Mydax, Inc.: *See—*
Lowes, Albert R., 4,959,972, Cl. 62-200.000.

Myers, Earl C., Jr.: *See—*
Frantz, Robert H.; Mosser, Benjamin H., III; Myers, Earl C., Jr.; and Reynolds, Charles E., 4,960,388, Cl. 439-404.000.
Frantz, Robert H.; Mosser, Benjamin H., III; Myers, Earl C., Jr.; and Reynolds, Charles E., 4,960,389, Cl. 439-404.000.

Myszka, Ronald T.: *See—*
DiGiacomo, Frank A.; Malsbury, Alan J.; and Myszka, Ronald T., 4,960,358, Cl. 414-684.300.

Nabisco Brands, Inc.: *See—*
van Lengerich, Bernhard H., 4,960,043, Cl. 99-353.000.

Nad, Zsuzsanna: *See—*
Szalay, Erzsebet; Lugosi, Gyorgy; Kallay, Tamas U.; Nad, Zsuzsanna; Jelinek, Istvan; Simonidesz, Vilmos; Gyory, Peter; Nagy, Lajos; Lugosi, Marta; Santa nee Singola, Ilona; Besenyei, Gabor; and Simandi, Laszlo , 4,960,913, Cl. 552-206.000.

Nagano, Masashi, to Shimano Industrial Co., Ltd. Bicycle drive chain. 4,960,403, Cl. 474-213.000.

Nagasaki, Hideo; and Takemoto, Yasuzi, to Sumitomo Chemical Company, Limited. Rubber composition with nitrogen and phosphorous compound. 4,960,833, Cl. 525-329.300.

Nagata, Zenji, to Sanyo Shokuhin Kabushiki Kaisha. Apparatus for packing bean curd pieces. 4,959,936, Cl. 53-252.000.

Nagler, Michael: *See—*
Pomerantz, Itzchak; Cohen-Sabban, Joseph; Bieber, Avigdor; Kamir, Josef; Katz, Mathew; and Nagler, Michael, 4,961,154, Cl. 364-522.000.

Nagy, Ingrid E., to Ciba-Geigy Corporation. Stabilized aqueous solutions of pharmaceutically acceptable salts of ortho-(2,6-dichlorophenyl)-aminophenylacetic acid for opthalmic use. 4,960,799, Cl. 514-567.000.

Nagy, Lajos: *See—*
Szalay, Erzsebet; Lugosi, Gyorgy; Kallay, Tamas U.; Nad, Zsuzsanna; Jelinek, Istvan; Simonidesz, Vilmos; Gyory, Peter; Nagy, Lajos; Lugosi, Marta; Santa nee Singola, Ilona; Besenyei, Gabor; and Simandi, Laszlo , 4,960,913, Cl. 552-206.000.

Naito, Yasuo: *See—*
Mimura, Munehiko; Tatumi, Takumi; Naito, Yasuo; and Katayama, Kazuyori, 4,960,182, Cl. 180-179.000.

Nakagawa, Mitsuhisa; and Koseki, Shogo, to Nippon Chemi-Con Corporation. Focus voltage regulation circuit for cathode ray tubes. 4,961,031, Cl. 315-382.000.

Nakagawa, Shin-ichi; and Terane, Hideyuki, to Mitsubishi Denki Kabushiki Kaisha. Test circuit for logic circuits. 4,961,191, Cl. 371-22.100.

Nakagiri, Takashi; Nishimura, Yukuo; Sakai, Kunihiro; Tomida, Yoshinori; Eguchi, Ken; and Saito, Kenji, to Canon Kabushiki Kaisha. Image forming device. 4,960,679, Cl. 430-335.000.

Nakahara, Masaki: *See—*
Oguro, Hiroki; Okuyama, Nobutaka; and Nakahara, Masaki, 4,961,021, Cl. 313-412.000.

Nakajima, Hiroshi: *See—*
Imahori, Kazutomo; Kondo, Hitoshi; Nakajima, Hiroshi; and Iwasaki, Tatsuo, 4,960,696, Cl. 435-42.000.

Nakajima, Kiichi: *See—*
Kasuga, Toshihiro; Yoshida, Masahiro; Uno, Tomoko; and Nakajima, Kiichi, 4,960,733, Cl. 501-10.000.

Nakajima, Masahiro, to NEC Corporation. (1+N) Hitless channel switching system. 4,961,190, Cl. 371-8.200.

Nakamura, Kazunari, to Olympus Optical Co., Ltd. Endoscope apparatus. 4,961,110, Cl. 358-98.000.

Nakamura, Koutaro; and Kawashima, Yoshiro, to Fuji Photo Film Co., Ltd. Formulation of barcodein microencapsulated diazo thermodevelopable photo-recording method utilizing electric current activated minute matrixes to light record. 4,960,670, Cl. 430-138.000.

Nakamura, Masaaki; and Yasuoka, Tsutomu, to Pioneer Electronic Corporation. Light-beam-operated heating machine. 4,960,972, Cl. 219-85.120.

Nakamura, Shigeru: *See—*
Higuchi, Tetsuo; Yamaguchi, Sachio; Sugimura, You; Sugiura, Shinji; and Nakamura, Shigeru, 4,960,828, Cl. 525-162.000.

Nakamura, Takeaki: *See—*
Kubokawa, Hiroaki; Tsukaya, Takashi; Ueda, Yasuhiro; Nakamura, Takeaki; Ohshima, Yutaka; Hibino, Hiroki; Takayama, Shyuichi; and Hagino, Tadao, 4,960,106, Cl. 128-6.000.

Nakano, Masaki: *See—*
Hibi, Toshifumi; and Nakano, Masaki, 4,960,004, Cl. 74-200.000.

Nakano, Yoshio: *See—*
Tsubaki, Nobuyuki; and Nakano, Yoshio, 4,960,794, Cl. 514-547.000.

Nakasa, Masayuki; Ishikawa, Norio; and Hosomizu, Hiroshi, to Minolta Camera Kabushiki Kaisha. Electronic flash device for a camera and accessory shoe for mounting an electronic flash device on a camera. 4,961,083, Cl. 354-145.100.

Nakashima, Yoshihiro: *See—*
Honkura, Yoshinobu; Nakashima, Yoshihiro; Matsuo, Toru; and Murata, Kouji, 4,960,470, Cl. 148-12.00E.

Nakasuji, Kazuyuki: *See—*
Kuroda, Kouichi; Hayashi, Chihiro; and Nakasuji, Kazuyuki, 4,959,985, Cl. 72-97.000.

Nakata, Yoshinori: *See—*
Okutani, Takeshi; Nakata, Yoshinori; Suzuki, Masaaki; and Akiyama, Takeo, 4,960,573, Cl. 423-22.000.

Nakatsuka, Masakatsu: *See—*
Itoh, Hisato; Oguchi, Takahisa; Enomoto, Katashi; Nakatsuka, Masakatsu; and Nishizawa, Tsutomu, 4,960,538, Cl. 252-299.200.

Nakayama, Hiroshi; Kojima, Keiji; and Sato, Gen, to Ricoh Company, Ltd. Pattern recognition method. 4,961,231, Cl. 382-21.000.

Nakayama, Muneo: *See—*
Tanitsu, Katsuya; Nakayama, Muneo; and Sato, Yoshimi, 4,960,618, Cl. 427-226.000.

Nakayama, Satoshi: *See—*
Akahori, Takashi; and Nakayama, Satoshi, 4,960,071, Cl. 118-722.000.

Nakayama, Sunichi: *See—*
Takahashi, Yutaka; Harashima, Ikuo; Nakayama, Sunichi; Arai, Yasuyuki; Takayanagi, Yasushi; Sekiguchi, Ryoichi; Abe, Tomomitsu; and Hayakawa, Hiroshi, 4,960,228, Cl. 222-129.100.

Nappa, Mario J.; Sievert, Allen C.; and Tong, Walter R., to Du Pont de Nemours, E. I., and Company. Novel perfluoropolyethers. 4,960,951, Cl. 568-615.000.

Narisada, Masayuki; Ohtani, Mitsuaki; Watanabe, Fumihiko; Hagishita, Sanji; Seno, Kaoru; Kamata, Susumu; Haga, Nobuhiro; Tsuri, Tatsuo; Tsushima, Tadahiko; and Kawada, Kenji, to Shionogi & Co., Ltd. 7-oxabicyclo[2.2.1] heptane sulfonamide derivatives. 4,960,909, Cl. 549-463.000.

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Watanabe, Shoichi; Takei, Takayuki; Hayashi, Terumine; and Natabe, Takashi, 4,960,724, Cl. 437-51.000.

National Research Institute for Earth Science & Disaster Prevention, Science & Technology Agency: *See—*
Takahashi, Kozo; and Fujinawa, Yukio, 4,961,143, Cl. 364-421.000.

National Semiconductor Corporation: *See—*
Davis, Jeffrey B., 4,961,010, Cl. 307-443.000.

National Starch and Chemical Investment Holding Corporation: *See—*
Chiu, Chung-wai; and Chua, Hunter, 4,960,604, Cl. 426-557.000.

National Steel Corporation: *See—*
Buchanan, Robert H., Jr., 4,959,939, Cl. 52-462.000.

Natori, Shunji, to Sanwa Kagaku Kenkyusho Co., Ltd. Lectin like protein substance, method of obtaining same and anti-tumor agent comprising same. 4,960,756, Cl. 514-8.000.

NCR Corporation: *See—*
Brooks, Ralf M.; Kallin, Fredrik L. N.; Marshall, Gary R.; and Reid, Bruce A., 4,960,336, Cl. 400-61.000.

NEC Corporation: *See—*
Endo, Kenji, 4,961,196, Cl. 372-45.000.
Hirakawa, Noboru, 4,961,104, Cl. 357-71.000.
Kojima, Shingo, 4,961,161, Cl. 364-736.500.
Nakajima, Masahiro, 4,961,190, Cl. 371-8.200.
Saitoh, Manzoh; and Okamura, Kenji, 4,961,103, Cl. 357-59.000.
Takahashi, Tsutomu, 4,961,229, Cl. 381-42.000.
Takasaki, Shigeru, 4,961,156, Cl. 364-578.000.
Tsugane, Shuzo; and Yasuda, Tooru, 4,961,211, Cl. 379-54.000.
Uehara, Izushi, 4,961,132, Cl. 364-200.000.
Yamanaka, Yutaka, 4,960,313, Cl. 350-6.100.

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Nelson, James E.; Castro, Valentine A.; and Esparza, Noemi, to Figgie International, Inc. Half-face mask assembly. 4,960,121, Cl. 128-206.240.

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Nelson, Michael B. Musical scale determining device. 4,960,029, Cl. 84-473.000.

Nelson, Ronald E. Ankle restraint device. 4,960,135, Cl. 128-80.00H.

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Vedres, Andras; Szantay, Csaba; Stefko, Bela; Kreidl, Janos; Nemes, Andras; Blasko, Gabor; Bogach, Erik; Mathe, Denes; Hegedus, Istvan; Szuchovszky, Adrien, nee Gergely; and Mester, Tamas, 4,960,888, Cl. 544-323.000.

Nemoto, Takeo: *See*—
Saho, Norihide; Nemoto, Takeo; Ogata, Hisanao; and Saeki, Mitsuru, 4,959,964, Cl. 62-51.100.

Neogi, Amar N.: *See*—
Stephens, R. Scott; Westland, John A.; and Neogi, Amar N., 4,960,763, Cl. 514-57.000.

Neppl, Franz: *See*—
Roeska, Guenther; Winnerl, Josef; and Neppl, Franz, 4,960,489, Cl. 156-652.000.

Nerhus, Arne; and Nerhus, Johan, to Olve Industrier A/S; and Nerhus, Johan. Sausage twisting apparatus and method. 4,959,888, Cl. 17-34.000.

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Neubauer, Hans-Juergen; Buerstinghaus, Rainer; Kuenast, Christoph; and Hofmeister, Peter, to BASF Aktiengesellschaft. Cyclopropanecarboxamides. 4,960,796, Cl. 514-624.000.

Neuman, Manfred; ZeiBig, Gerhard; Ihle, Karl-Heinz; Madler, Eckerhard; Schiller, Siegfried; and Schroller, Rudolf, to Bakish Materials Corporation. Method for web coating by means of an electron beam. 4,960,607, Cl. 427-8.000.

Neumann, Adalbert; and Stumpf, Heinrich, to Asea Brown Boveri Aktiengesellschaft. Radiation detector. 4,960,995, Cl. 250-347.000.

New DEST Corporation: *See*—
Rumley, Stuart D., 4,961,117, Cl. 358-461.000.

Newkirk, Raymond K.; and Holker, David G., to Tape Inc. Apparatus and process for the fusion bonding of thermoplastic articles. 4,960,478, Cl. 156-228.000.

Newton, Christopher G.: *See*—
Ashton, Michael J.; Bridge, Andrew W.; Dron, Donald I.; Fenton, Garry; Lythgoe, David J.; Newton, Christopher G.; Riddell, David; Smith, Christopher; and Stuttle, Keith A. J., 4,960,775, Cl. 514-248.000.

NGK Insulators, Ltd.: *See*—
Takeuchi, Yukihisa; and Hirota, Toshikazu, 4,961,078, Cl. 346-76.0PH.

Nguyen-Thanh, Thong: *See*—
Vigneron, Gilbert; Bezier, Jean; Nguyen-Thanh, Thong; Vidal, Pierre; Zacharie, Guy; and Guillemin, Lucien, 4,960,650, Cl. 428-594.000.

Nguyen, Thinn; Lazouni, Abdelkrim; and Doan, Kim S., to MOLTECH Invent S.A. Ceramic/metal composite material. 4,960,494, Cl. 204-67.000.

Nguyenphu, Myhong; and Thatcher, Larry E., to International Business Machines Corporation. Multiprocessing system for performing floating point arithmetic operations. 4,961,162, Cl. 364-748.000.

Nichols Hydraulic Products, Ltd.: *See*—
Nichols, Peter W., 4,960,265, Cl. 254-93.00R.

Nichols, Peter W., to Nichols Hydraulic Products, Ltd. Devices for applying pressure to a closed door. 4,960,265, Cl. 254-93.00R.

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Harvey, Michael A.; Manning, Brenda D.; Nicholson, Mary L.; Travis, Karen L.; and Luderer, Albert A., 4,960,716, Cl. 436-542.000.

Nick, Howard H.; Osborn, Brock E.; and Wu, Chang Y., to International Business Machines. Method and apparatus for electrostatic discharge testing of machines which repetitively execute a stored program with a plurality of program steps. 4,961,157, Cl. 364-579.000.

Nicolas, Guy, to Cime Bocuze. Heavy tungsten-nickel-iron alloys with very high mechanical characteristics. 4,960,563, Cl. 419-23.000.

Nicolon Corporation: *See*—
Willibey, Gary L.; Hawkins, John W.; Harp, Russell P.; and Wilkinson, David M., 4,960,349, Cl. 405-262.000.

Nicora, Carlo: *See*—
Molteni, Giuseppe; Nicora, Carlo; Cesaro, Attilio; and Pricl, Sabrina, 4,960,876, Cl. 536-114.000.

Nielsen, Paul: *See*—
Habib, Joseph; Nielsen, Paul; and Nielsen, Paul H., 4,961,055, Cl. 324-662.000.

Nielsen, Paul H.: *See*—
Habib, Joseph; Nielsen, Paul; and Nielsen, Paul H., 4,961,055, Cl. 324-662.000.

Nihon Seimitsu Kogyo Kabushiki Kaisha: *See*—
Komatsuzaki, Hiroshi; Kamata, Kazuo; Ohmiya, Akio; Nishimura, Syunji; Umeda, Yoshihito; Mochizuki, Noriya; and Furuya, Eiji, 4,961,084, Cl. 354-268.000.

Nihon Tokushu Noyaku Seizo K. K.: *See*—
Shiokawa, Kozo; Tsuboi, Shinichi; Sasaki, Shoko; Moriya, Koichi; Hattori, Yumi; and Shibuya, Katsuhiko, 4,960,780, Cl. 514-300.000.

Nilsson, Richard C.; and Berry, James M., to Alcatel NA, Inc. Optical fiber cable. 4,960,318, Cl. 350-96.230.

Ninijima, Mitsuru: *See*—
Hanyu, Susumu; Kasuga, Noboru; Hara, Kazumasa; Koike, Mikio; and Ninijima, Mitsuru, 4,960,062, Cl. 112-255.000.

Nippon Chemi-Con Corporation: *See*—
Nakagawa, Mitsuhisa; and Koseki, Shogo, 4,961,031, Cl. 315-382.000.

Nippon Elanco Kabushiki Kaisha: *See*—
Yamamoto, Taizo; and Inoue, Masakiyo, 4,959,943, Cl. 53-282.000.

Nippon Kayaku Kabushiki Kaisha: *See*—
Kato, Kuniki; Takita, Tomohisa; Nishiyama, Shigeru; and Yamamura, Shosuke, 4,960,910, Cl. 549-510.000.
Tunoda, Mituaki; and Suzuki, Nobuharu, 4,960,435, Cl. 8-526.000.

Nippon Mektron Limited: *See*—
Sonoi, Takehiro; Sagawa, Toshimasa; Yamada, Okimasa; and Mizuno, Tetsuya, 4,960,947, Cl. 508-399.000.

Nippon Oil and Fats Co., Ltd.: *See*—
Tsubaki, Nobuyuki; and Nakano, Yoshio, 4,960,794, Cl. 514-547.000.

Nippon Sanso Kabushiki Kaisha: *See*—
Toida, Shouji; Iwasaki, Kazunori; Goto, Toru; and Tsuchiya, Shigeru, 4,960,218, Cl. 215-311.000.

Nippon Steel Corporation: *See*—
Kanai, Takao; Tanemoto, Kei; Kubo, Hiroshi; and Sato, Toyohiko, 4,960,734, Cl. 501-98.000.
Wada, Toshiya; Tanaka, Osamu; Egawa, Takatoshi; Yoshida, Makato; Higuchi, Seizun; and Izaki, Teruaki, 4,960,652, Cl. 428-611.000.
Yamada, Teruaki; Akisue, Osamu; Ukena, Toshiyasu; Oda, Masahiko; and Hayashida, Teruki, 4,960,158, Cl. 148-156.000.

Nippon Television Network Corporation: *See*—
Sugimori, Yoshio; Araki, Yousai; and Urano, Joji, 4,961,112, Cl. 358-141.000.

Nishida, Toshio: *See*—
Okuda, Takanari; Nomura, Shigeo; Shibahara, Itaru; Tateishi, Yoshinori; Hirano, Susumu; Teranishi, Hiroshi; Fujiwara, Masayuki; and Nishida, Toshio, 4,960,562, Cl. 376-416.000.

Nishijima, Tsunemasa, to Hitachi, Ltd. Gas turbine system and method of controlling the same. 4,959,954, Cl. 60-39.020.

Nishikawa, Masao; Hirose, Masato; and Ozawa, Masaru, to Honda Giken Kogyo Kabushiki Kaisha. Hydraulic pressure system. 4,959,958, Cl. 60-415.000.

Nishikawa, Masao: *See*—
Kumagai, Yomoharu; Hirose, Masato; and Nishikawa, Masao, 4,960,040, Cl. 92-261.000.

Nishikawa, Masayuki; Komori, Yumiko; Yokoi, Masaki; Ono, Masato; Takahashi, Noriyoshi; Fukuda, Yuzuru; Yagi, Shigeru; and Karakida, Ken-ichi, to Fuji Xerox Co., Ltd. Positively and negatively chargeable electrophotographic photoreceptor. 4,960,662, Cl. 430-64.000.

Nishikawa, Toshihiro; Takada, Shunji; and Hasebe, Kazunori, to Fuji Photo Film Co., Ltd. Color photographic light-sensitive material and method of developing the same. 4,960,689, Cl. 430-603.000.

Nishimura, Makoto. Electrically heatable sheet prepared by paper. 4,960,979, Cl. 219-549.000.

Nishimura, Masato: *See*—
Miura, Satoshi; Nishimura, Masato; Itoh, Shigeki; and Asari, Takashi, 4,960,749, Cl. 503-213.000.

Nishimura, Matsuomi, to Canon Kabushiki Kaisha. Developing apparatus. 4,960,070, Cl. 118-658.000.

Nishimura, Syunji: *See*—
Komatsuzaki, Hiroshi; Kamata, Kazuo; Ohmiya, Akio; Nishimura, Syunji; Umeda, Yoshihito; Mochizuki, Noriya; and Furuya, Eiji, 4,961,084, Cl. 354-268.000.

Nishimura, Yukuo: *See*—
Nakagiri, Takashi; Nishimura, Yukuo; Sakai, Kunihiro; Tomida, Yoshinori; Eguchi, Ken; and Saito, Kenji, 4,960,679, Cl. 430-335.000.

Nishio, Maki; Kakushima, Masatoshi; Konishi, Masataka; and Oki, Toshikazu, to Bristol-Myers Company. BU-3608 derivatives. 4,960,755, Cl. 514-8.000.

Nishitani, Kazuharu, to Mitsubishi Denki Kabushiki Kaisha. Semiconductor integrated circuit device responsive to clock signals having different amplitudes. 4,961,012, Cl. 307-465.000.

Nishitsuji, Toshihiko: *See*—
Harada, Isao; Yoda, Yukihiro; Iwanaga, Naruyuki; Nishitsuji, Toshihiko; and Kikkawa, Akio, 4,960,581, Cl. 423-489.000.

Nishiyama, Shigeru: *See*—
Kato, Kuniki; Takita, Tomohisa; Nishiyama, Shigeru; and Yamamura, Shosuke, 4,960,910, Cl. 549-510.000.

Nishizawa, Tsutomu: *See*—
Itoh, Hisato; Oguchi, Takahisa; Enomoto, Katashi; Nakatsuka, Masakatsu; and Nishizawa, Tsutomu, 4,960,538, Cl. 252-299.200.

Nissan Motor Co., Ltd.: *See*—
Akasaka, Akio; Suga, Seiji; and Yasuda, Makoto, 4,960,084, Cl. 123-90.170.
Hibi, Toshifumi; and Nakano, Masaki, 4,960,004, Cl. 74-200.000.
Imaseki, Takashi, 4,961,042, Cl. 318-758.000.
Yasuda, Makoto, 4,959,956, Cl. 60-323.000.

Nitto Denko Corporation: *See*—
Sekiguchi, Hideo; Mitoh, Yasuo; and Misawa, Yozi, 4,960,268, Cl. 269-43.000.

Nitto Kohki Co., Ltd.: *See*—
Kishi, Katsunobu, 4,960,352, Cl. 409-180.000.

Niznick, Gerald A., to Core-Vent Corporation. Screw-type dental implant anchor. 4,960,381, Cl. 433-174.000.

Noce, Louis O.; and Basta, Michael, to L.O.N. Research, Inc. Disposable transducer manifold. 4,960,127, Cl. 128-675.000.

Noda Institute for Scientific Research: *See*—
Horiuchi, Tatsuo; and Kurokawa, Toshiko, 4,960,701, Cl. 435-190.000.

Nodelman, Neil H., to Mobay Corporation. Process and compositions for production of moldings. 4,960,537, Cl. 252-182.280.

Nogata, Keiko: *See*—
Sagai, Hitoshi; Nogata, Keiko; and Takahashi, Mamoru, 4,960,877, Cl. 536-27.000.

Noguchi, Tatsuo, to Kabushiki Kaisha Toshiba. Semiconductor device and manufacturing process for providing device regions on the semiconductor device and isolation regions to isolate the device regions from each other. 4,960,725, Cl. 437-57.000.

Noh, Joong S.: *See*—
Schwarz, James A.; Noh, Joong S.; and Agarwal, Rajiv K., 4,960,450, Cl. 62-18.000.

Noiles, Douglas G., to Joint Medical Products Corporation. Ball and socket bearing for artifical joint. 4,960,427, Cl. 623-22.000.

Nomura, Osamu: *See*—
Fujitsu Limited; Maki, Yasuhiko; and Nomura, Osamu, 4,961,170, Cl. 365-190.000.

Nomura, Setsuko: *See*—
Hoshino, Tatsuo; Nomura, Setsuko; and Sugisawa, Teruhide, 4,960,695, Cl. 435-42.000.

Nomura, Shigeo: *See*—
Okuda, Takanari; Nomura, Shigeo; Shibahara, Itaru; Tateishi, Yoshinori; Hirano, Susumu; Teranishi, Hiroshi; Fujiwara, Masayuki; and Nishida, Toshio, 4,960,562, Cl. 376-416.000.

Nonogaki, Masaru: *See*—
Okada, Takashi; Ogawa, Masumi; Asano, Mitsuyasu; and Nonogaki, Masaru, 4,961,113, Cl. 358-167.000.

Norand Corporation: *See*—
Koenck, Steven E., 4,961,043, Cl. 320-21.000.

Noranda, Inc.: *See*—
Rowlands, John A.; Araj, Naoum; and Davis, Herbert J., 4,961,209, Cl. 378-29.000.

Norddeutsche Schleifmittel-Industrie Christiansen & Co (GmbH & Co): *See*—
Wagner, Eckhard; and Eichler, Angelika, 4,960,442, Cl. 51-295.000.

Nordson Corporation: *See*—
Stumphauzer, William C.; and Fetcenko, Raymond M., 4,960,628, Cl. 428-81.000.

Noristi, Luciano: *See*—
Sevini, Franco; and Noristi, Luciano, 4,960,593, Cl. 524-99.000.

Normalair-Garrett (Holdings) Limited: *See*—
Hamlin, Humphrey A. S., 4,960,119, Cl. 128-204.180.

Norrington, Franklin E. A.: *See*—
Hadfield, Susan G.; and Norrington, Franklin E. A., 4,960,713, Cl. 436-523.000.
Hadfield Susan G.; and Norrington, Franklin E. A., 4,960,714, Cl. 436-523.000.
Hadfield, Susan G.; and Norrington, Franklin E. A., 4,960,715, Cl. 436-523.000.

Norris, Hugh R.: *See*—
Rice, Edwin E.; and Norris, Hugh R., 4,960,202, Cl. 198-781.000.

Norsk Hydro a.s.: *See*—
Salte, Ragnal; and Thomassen, Magny S., 4,960,795, Cl. 514-560.000.

Northern Telecom Limited: *See*—
Marks, Robert J.; and Kupferschmidt, Albert, 4,960,394, Cl. 439-719.000.

Norton Company: *See*—
Pellow, Scott W.; Trischuk, Ronald W.; Knapp, Christopher E.; and Bauer, Ralph, 4,960,441, Cl. 51-293.000.

Notomi, Seishi: *See*—
Kuroda, Shigeru; Mimura, Takashi; and Notomi, Seishi, 4,961,194, Cl. 357-22.000.

Novatome: *See*—
Hubert, Philippe; and Martin, Eric, 4,960,152, Cl. 137-559.000.

Nozawa, Yasuto; Tanigawa, Shigeho; and Iwasaki, Katsunori, to Hitachi Metals, Ltd. Gallium-containing magnet for a motor. 4,960,474, Cl. 148-302.000.

Nozawa, Yasuto: *See*—
Tanigawa, Shigeho; Iwasaki, Katsunori; and Nozawa, Yasuto, 4,960,469, Cl. 148-105.000.

NPI: *See*—
Klocke, James A.; and Yamasaki, Ronald B., 4,960,791, Cl. 514-468.000.

NSK-Warner Kabushiki Kaisha: *See*—
Ogata, Hirofumi; and Kitamura, Noboru, 4,960,189, Cl. 192-41.00A.

Nukem GmbH: *See*—
Lenck, Norbert; and Worner, Jorg, 4,960,141, Cl. 134-61.000.

Nunes, Maurice; Grimanis, Michael P.; Hurley, James R.; and Shukla, Kailash C., to Gas Research Insitute. Gas/air mixing valve. 4,960,377, Cl. 431-12.000.

Nyman, Sigurd, to Frontec Produkter Aktiebolag. Determining a reference in a method of detecting overheating of bearings. 4,960,251, Cl. 246-169.00A.

O&K Orenstein & Koppel Aktiengesellschaft: *See*—
Kipp, Thorwald; and Wiechers, Bernhard, 4,960,306, Cl. 299-41.000.

Oaland, Knut S.: *See*—
Aarre, Arne; and Oaland, Knut S., 4,960,341, Cl. 403-24.000.

Obenshain, James R., to Cedar Works, Inc., The. Spring supported mailbox post. 4,960,255, Cl. 248-156.000.

Obermeyer, John R., Jr.; Shelton, John F.; and Williamson, Donald A., to Hewlett-Packard Company. Apparatus for generation of scan control signals for initialization and diagnosis of circuitry in a computer. 4,961,013, Cl. 307-480.000.

Obertegger, Franz: *See*—
Gandini, Mario; and Obertegger, Franz, 4,961,087, Cl. 355-71.000.

Obrecht, Robert E.; and Waltonen, Edward J., to REO Hydraulic Pierce & Form. Force multiplying press. 4,959,989, Cl. 72-450.000.

Obrist, Frank; Wankel, Felix H., deceased; by Renz, Gerhard, executor; by Meysen, Fried, executor; and by Burkhardt, Thomas, executor. Internal axis rotary piston machine. 4,960,370, Cl. 418-9.000.

O'Callaghan, John S., Sr.: *See*—
Frystak, Richard; O'Callaghan, John S., Sr.; and Colson, Jean-Jacques, 4,960,273, Cl. 271-10.000.

Occidental Chemical Corporation: *See*—
DeWald, Raymond C.; and Hong, Paul O., 4,960,885, Cl. 544-35.000.
O'Reilly, Neil J.; Sojka, Stanley A.; and Lin, Henry C., 4,960,938, Cl. 564-366.000.
Schwartz, Willis T., 4,960,905, Cl. 549-243.000.

O'Connell, James A.: *See*—
Elliott, John C.; O'Connell, James A.; Ladouceur, Lawrence; Altman, William; and Jarett, Keith, 4,961,142, Cl. 364-408.000.

Oda, Hidemasa; Moritani, Tohei; Hirofuji, Satoshi; and Okuno, Kenji, to Kuraray Co., Ltd. Multilayered container. 4,960,639, Cl. 428-34.500.

Oda, Masahiko: *See*—
Yamada, Terusaki; Akisue, Osamu; Ukena, Toshiyasu; Oda, Masahiko; and Hayashida, Teruki, 4,960,158, Cl. 148-156.000.

Oda, Yutaka. Anti-skid device for tired vehicle wheels. 4,960,159, Cl. 152-216.000.

Odaka, Masanori: *See*—
Miyaoka, Shuuichi; Odaka, Masanori; Higuchi, Hiroshi; and Arai, Toshikazu, 4,961,164, Cl. 365-177.000.

Oehlenschlaeger, Ulla; Pedersen, Jan R.; and Sorensen, Erling, to PLM AB. Method for crystallizing thermoplastic material. 4,960,556, Cl. 264-322.000.

Office National d'Etudes et de Recherche Aerospatiales: *See*—
Verdier, Claude; Leporcq, Bruno; Georges, Eric; and Barraud, Roger, 4,961,200, Cl. 372-89.000.

Ogasawara, Hitoshi: *See*—
Baba, Kenji; Watanabe, Shoji; Yahagi, Hayao; and Ogasawara, Hitoshi, 4,960,512, Cl. 210-96.100.

Ogata, Hirofumi; and Kitamura, Noboru, to NSK-Warner Kabushiki Kaisha. Serpentine-shaped sprag retainer of a sprag-synchronized one-way clutch. 4,960,189, Cl. 192-41.00A.

Ogata, Hisanao: *See*—
Saho, Norihide; Nemoto, Takeo; Ogata, Hisanao; and Saeki, Mitsuru, 4,959,964, Cl. 62-51.100.

Ogawa, Kazufumi, to Matsushita Electric Industrial Co., Ltd. Sensor using a field effect transistor and method of fabricating the same. 4,960,722, Cl. 437-40.000.

Ogawa, Masao: *See*—
Masuda, Yoshitomo; Ogawa, Masao; Arai, Katsuhiko; Suzuki, Kinya; Fuse, Tadashi; and Amano, Tetsuro, 4,960,657, Cl. 429-194.000.

Ogawa, Masazumi; Watanabe, Kenichi; and Yamazaki, Tsutomu, to Fuji Photo Film Co., Ltd. Torsion spring mounting apparatus. 4,959,897, Cl. 29-227.000.

Ogawa, Masumi: *See*—
Okada, Takashi; Ogawa, Masumi; Asano, Mitsuyasu; and Nonogaki, Masaru, 4,961,113, Cl. 358-167.000.

Ogawa, Riichi: *See*—
Iizuka, Shigeo; Kishi, Takao; Ogawa, Riichi; and Mizushima, Hiroshi, 4,960,339, Cl. 401-129.000.

Ogawara, Hiroshi: *See*—
Ito, Noriki; Ogawara, Hiroshi; and Watanabe, Shunichi, 4,960,908, Cl. 549-403.000.

Ogino, Masanori; Yamada, Takeo; Ikeda, Miyuki; and Kimoto, Toshiyuki, to Hitachi, Ltd. Miss convergence compensating device for projection type display. 4,961,030, Cl. 315-368.000.

Oguchi, Takahisa: *See*—
Itoh, Hisato; Oguchi, Takahisa; Enomoto, Katashi; Nakatsuka, Masakatsu; and Nishizawa, Tsutomu, 4,960,538, Cl. 252-299.200.

Ogura, Jayme H.: *See*—
Rodrigues, Renato S.; and Ogura, Jayme H., 4,960,174, Cl. 166-342.000.

Ogura, Manabu: *See*—
Ueda, Takaharu; Yamamoto, Tetsu; Ogura, Manabu; and Yumura, Takashi, 4,961,118, Cl. 358-497.000.

Oguro, Hiroki; Okuyama, Nobutaka; and Nakahara, Masaki, to Hitachi, Ltd. Convergence apparatus and convergence yoke used therefor. 4,961,021, Cl. 313-412.000.

Ohkawa, Atsuhiro, to Fuji Photo Film Co., Ltd. 4'-alkoxy-2,2':6',2''-terpyridine derivatives. 4,960,895, Cl. 546-257.000.

Ohmiya, Akio: *See*—
Komatsuzaki, Hiroshi; Kamata, Kazuo; Ohmiya, Akio; Nishimura, Syunji; Umeda, Yoshihito; Mochizuki, Noriya; and Furuya, Eiji, 4,961,084, Cl. 354-268.000.

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King, Michael T.; and Petges, Neal E., 4,960,484, Cl. 156-499.000.

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Pfeifer, William, to Armstrong Store Fixture Coporation. Hanger support guard. 4,960,213, Cl. 211-123.000.
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Danilewicz, John C.; and James, Keith, 4,960,792, Cl. 514-481.000.
Gymer, Geoffrey E.; and Richardson, Kenneth, 4,960,782, Cl. 514-383.000.
Howard, Harry R., Jr.; and Sarges, Reinhard, 4,960,785, Cl. 514-411.000.
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Christner, Juergen; Pfleiderer, Ernst; and Taeger, Tilman, 4,960,428, Cl. 8-94.180.
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Gruenberg, Eric I.; Halicho, James J.; Phillips, Melvin J.; and Hulick, Troy K., 4,959,887, Cl. 16-223.000.
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Holland, Floyd H., 4,960,502, Cl. 208-85.000.
Klendworth, Douglas D.; and McDaniel, Max P., 4,960,748, Cl. 502-210.000.
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Pinkham, Raymond; and Balistreri, Anthony M., to Texas Instruments Incorporated. Read/write memory having an on-chip input data register. 4,961,171, Cl. 365-230.050.
Pioneer Electronic Corporation: *See*—
Kanamaru, Hitoshi; and Watanabe, Tsuyoshi, 4,961,116, Cl. 358-343.000.
Nakamura, Masaaki; and Yasuoka, Tsutomu, 4,960,972, Cl. 219-85.120.
Tanaka, Hideo, 4,961,109, Cl. 358-84.000.
Pirastehfar, Hassan; Onodera, George C.; Law, Waisiu; and Heminger, David M., to Motorola Inc. High frequency photo detector and method for the manufacture thereof. 4,961,097, Cl. 357-30.000.
Pirelli General plc: *See*—
Alesbury, Colin K., 4,960,837, Cl. 525-420.000.
Pischtschan, Alfred: *See*—
Eichenauer, Herbert; Leitz, Edgar; Ott, Karl-Heinz; and Pischtschan, Alfred, 4,960,822, Cl. 525-67.000.
Pitchen, Philippe: *See*—
Bourzai, Jean-Dominique; Capet, Marc; Cotrel, Claude; Labaudiniere, Richard; Pitchen, Philippe; and Roussel, Gerard, 4,960,779, Cl. 514-300.000.
PLM AB: *See*—
Oehlenschlaeger, Ulla; Pedersen, Jan R.; and Sorensen, Erling, 4,960,556, Cl. 264-322.000.
Plonka, Francis E.: *See*—
Holda, Steven F.; Plonka, Francis E.; VandenBrossche, Daniel J.; and Felice, John S., 4,961,148, Cl. 364-468.000.
Polaroid Corporation: *See*—
Borror, Alan L.; and Ellis, Ernest W., 4,960,901, Cl. 548-207.000.
Polifarma S.P.A.: *See*—
De Luca, Giovanna; Di Stazio, Giovanni; Materazzi, Mario; and Politi, Vincenzo, 4,960,759, Cl. 514-50.000.
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Shimazu, Ken-ichi; Patel, Jayanti; and Tolfree, Jill, 4,960,663, Cl. 430-70.000.
Pomerantz, Itzchak; Cohen-Sabban, Joseph; Bieber, Avigdor; Kamir, Josef; Katz, Mathew; and Nagler, Michael, to Scitex Corporation Ltd. Three dimensional modelling apparatus. 4,961,154, Cl. 364-522.000.
Poole, Jon M.; and Curtis, Lindy J., to Inco Alloys International, Inc. Method for surface activation of water atomized powders by pickling. 4,960,459, Cl. 419-63.000.
Popovich, Eric S. Fish stringing system. 4,960,231, Cl. 224-103.000.
Porta-Blind, Inc.: *See*—
Wheatley, E. Durwood; and Wheatley, Elaine P., 4,960,144, Cl. 135-101.000.
Porter, Joseph G.: *See*—
Beinhaur, Ernest L.; and Porter, Joseph G., 4,960,391, Cl. 439-559.000.
Portugall, Michael; Schumacher, Franz; and Seiler, Erhard, to BASF Aktiengesellschaft. Production of sheetlike preshapes. 4,960,552, Cl. 264-108.000.
Potratz, Douglas R., to Brunswick Corporation. Stern drive marine propulsion system with automatic trim control and exhaust control. 4,960,398, Cl. 440-53.000.
Pott, Ronald W.; and Grimm, William G., to R.W. Investment Co. Method and apparatus for forming curved handrails. 4,960,137, Cl. 144-349.000.
PPG Industries, Inc.: *See*—
Walters, Patricia B.; and Allen, David C., 4,960,631, Cl. 428-192.000.
Prass, Werner: *See*—
Erdelen, Christian; Ringsdorf, Helmut; Prass, Werner; and Scheunemann, Ude, 4,960,635, Cl. 428-220.000.
Preis, Hans M.: *See*—
Kumpe, Gerhardt; Wormsbacher, Wilfried; Heimburger, Norbert; Fuhge, Peter; and Preis, Hans M., 4,960,757, Cl. 514-21.000.
Preuss, Donald R.: *See*—
Pan, Kee-Chuan; Tyan, Yuan-Sheng; and Preuss, Donald R., 4,960,680, Cl. 430-346.000.
Prewo, Karl M.: *See*—
Jarmon, David C.; and Prewo, Karl M., 4,960,629, Cl. 428-113.000.
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Molteni, Giuseppe; Nicora, Carlo; Cesaro, Attilio; and Pricl, Sabrina, 4,960,876, Cl. 536-114.000.
Pries, Werner: *See*—
McLeod, Robert; Card, Howard; Hortensius, Peter; and Pries, Werner, 4,961,159, Cl. 364-717.000.
Procter & Gambie Co., The: *See*—
Kester, Jeffrey J.; Bernhardt, Christian A.; Elsen, Joseph J.; Letton, James A.; and Fox, Mary M., 4,960,600, Cl. 426-310.000.
Talkington, Sherry R.; Abe, Susan S.; and Mijac, Marko D., 4,960,602, Cl. 426-534.000.
Products Research & Chemical Corporation: *See*—
Singh, Hakam, 4,960,844, Cl. 528-17.000.
Professional Supply, Inc.: *See*—
Kiser, Thomas E., 4,960,041, Cl. 98-1.500.
Proll, Manfred, to Klockner Ferromatik Desma GmbH. Apparatus for molding outer and inner soles and a sole welt onto shoe uppers. 4,960,374, Cl. 425-119.000.
Prost, Gerard: *See*—
Buffenoir, Marc; Pierret, Rene ; Hellegouarc'h, Jean; and Prost, Gerard, 4,960,967, Cl. 219-10.491.
Prost, Gilbert: *See*—
Cruchon, Jean-Claude; and Prost, Gilbert, 4,961,061, Cl. 333-156.000.
Proulx, Raymond E. Simple flail feedout mechanism for a rotary mower. 4,959,904, Cl. 30-276.000.
Provence, Marc; Rousset, Didier; and Dunand, Josiane, to Salomon S.A. Cross-country ski shoe for use with an elastic biasing element. 4,959,913, Cl. 36-117.000.
Proxitronic Funk GmbH & Co. KG: *See*—
Funk, Hans W.; Frank, Kurt; and Engel, Bernd, 4,961,026, Cl. 313-525.000.
Puckette, Thomas A.: *See*—
Devon, Thomas J.; Phillips, Gerald W.; Puckette, Thomas A.; Stavinoha, Jerome L.; and Vanderbilt, Jeffrey J., 4,960,949, Cl. 568-454.000.
Puentes-Bravo, Eduardo; Gillis, Marcel; and Somers, Andreas J., to Colgate-Polmolive Company. Diammonium compound containing fabric softening and antistatic detergent composition. 4,960,526, Cl. 252-8.800.
Puppe, Lothar: *See*—
Botta, Artur; Buysch, Hans-Josef; Puppe, Lothar; and Arlt, Dieter, 4,960,943, Cl. 568-319.000.
Purkait, Bobby K.: *See*—
Yan, John Y. J.; and Purkait, Bobby K., 4,960,425, Cl. 623-8.000.
Puydak, Robert C.: *See*—
Hazelton, Donald R.; Puydak, Robert C.; and Booth, D. A., 4,960,830, Cl. 525-196.000.
Quali Tech, Inc.: *See*—
Brokken, Kyle A., 4,960,452, Cl. 71-26.000.
Quantz, Chester C., to Electro-Tech, Inc. Gun firing relay circuit. 4,960,033, Cl. 89-28.050.
Quella, John F.: *See*—
Aiello, Salvatore F.; Brown, Jeffrey K.; Karasek, Donald F.; Lazzeroni, Edward J., Sr.; Lazzeroni, Edward J., Jr.; Quella, John F.; and Zollers, Timothy E., 4,959,923, Cl. 43-112.000.
R.W. Investment Co.: *See*—
Pott, Ronald W.; and Grimm, William G., 4,960,137, Cl. 144-349.000.
Rabb, Khalid M.; Sklut, Robert L.; and Daughton, John W., to Xerox Corporation. Pre-programmed pauses post-collation copying system. 4,961,092, Cl. 355-323.000.
Rabo, Jule A.: *See*—
Pellet, Regis J.; Rabo, Jule A.; Long, Gary N.; Gortsema, Frank P.; and Springer, Albert R., 4,960,504, Cl. 208-411.000.
Racchini, Joel R.: *See*—
Cadotte, John E.; and Racchini, Joel R., 4,960,518, Cl. 210-639.000.
Radiation Management Consultants, Inc.: *See*—
Linnemann, Thomas; and Linnemann, Kurt, 4,960,136, Cl. 128-845.000.
Radixx/World, Ltd.: *See*—
Luckanuck, John S., 4,960,621, Cl. 427-397.800.

Raetzsch, Manfred: *See*—
Koerber, Heinz; Hanke, Rudolf; Paessler, Helmar; Kesaler, Bernd; Raetzsch, Manfred; Heger, Adolf; and Kolletzky, Karlheinz, 4,960,430, Cl. 8-114.000.

Ragotin, Jean-Claude, to Thomson-CSF. Process for making microwave energy attenuating circuits. 4,960,487, Cl. 156-643.000.

Rahtz, Dieter: *See*—
Biere, Helmut; Huth, Andreas; Rahtz, Dieter; Schmiechen, Ralph; Seidelmann, Dieter; Stephens, David; Engelstoft, Mogens; and Hansen, John B., 4,960,777, Cl. 514-253.000.

Rajadhyaksha, Vithal J. Oxazolidinone penetration enhancing compounds. 4,960,771, Cl. 514-228.800.

Rametsteiner, Hermann; Schwaha, Karl; Hirschmanner, Franz; and Bramerdorfer, Heinz, to Voest-Alpine Industrieanlagenbau Gesellschaft m.b.h. Method of continuously casting a thin strip. 4,960,164, Cl. 164-480.000.

Ramirez, Anthony. Quick-release cymeal mounting fastener. 4,960,028, Cl. 84-421.000.

Ranciato, Peter. Body support apparatus. 4,960,115, Cl. 128-87.00R.

Rao, Bhaskara M. L.; Menke, James C.; and Hamlen, Robert P., to Alupower, Inc. Illuminated fishing lure and battery therefor. 4,959,919, Cl. 43-17.600.

Rao, R. Nagaraja: *See*—
Ingolia, Thomas D.; Kaster, Kevin R.; and Rao, R. Nagaraja, 4,960,704, Cl. 435-252.330.

Rassey, Louis J. Rotary valve construction utilizing a compressed gas as lubricant and coolant. 4,960,086, Cl. 123-190.0DL.

Ratka, Frances I.: *See*—
Suresh, Dev. D.; Grasselli, Robert K.; Ratka, Frances I.; and Brazdil, James F., 4,960,921, Cl. 558-325.000.

Rauchle, Kurt: *See*—
Metz, Gunter; Rauchle, Kurt; and Erdmann, Manfred, 4,960,793, Cl. 514-532.000.

Raychem Limited: *See*—
Towle, Ian D. H.; and Horner, Patrick J., 4,960,835, Cl. 525-398.000.

Raytheon Company: *See*—
Ward, Harold R., 4,961,075, Cl. 342-140.000.
Wendler, John P., 4,961,062, Cl. 333-164.000.

Rayudu, S. Rao: *See*—
Hollis, C. George; and Rayudu, S. Rao, 4,960,590, Cl. 424-78.000.

Razz Communications, Inc.: *See*—
Stocker, Harold L.; and Farr, William, 4,960,258, Cl. 248-467.000.

Razzaghi, Mahmoud. Compact high resolution high speed symmetrical scanning optics using multiple deflections. 4,960,312, Cl. 350-3.710.

RCA Licensing Corporation: *See*—
Anderson, Mark R., 4,961,059, Cl. 333-19.000.
Perlman, Stuart S., 4,961,108, Cl. 358-31.000.
Rodriguez-Cavazos, Enrique, 4,961,032, Cl. 315-397.000.

Reale, John, Jr.: *See*—
Pasternak, Mordechai; Bartels, Craig R.; Reale, John, Jr.; and Shah, Vatsal M., 4,960,519, Cl. 210-640.000.

Recontainer, Inc.: *See*—
Fields, Grethel C., III, 4,960,222, Cl. 220-5.00A.

Redmon, Daniel W.; and Brown, David K. Coaxial cable with composite outer conductor. 4,960,965, Cl. 174-102.00R.

Refractory Composites, Inc.: *See*—
Paquette, Edward L.; and Simpson, Marc G., 4,960,640, Cl. 428-368.000.

Regel, Erik: *See*—
Holmwood, Graham; Regel, Erik; Jager, Gerhard; Buchel, Karl H.; Lurssen, Klaus; Frohberger, Paul-Ernst; Brandes, Wilhelm; and Paul, Volker, 4,960,456, Cl. 71-92.000.
Holmwood, Graham; Kramer, Wolfgang; Regel, Erik; Elbe, Hans L.; Buchel, Karl H.; Dutzmann, Stefan; Brandes, Wilhelm; and Reinecke, Paul, 4,960,781, Cl. 514-383.000.

Reichel, Erich; Schmidt-Kloiber, Heinz; and Groke, Karl, to Leopold & Co. Chem. Pharm. Fabrik Gesellschaft M.B.H. Laser-induced shockwave lithotripsy. 4,960,108, Cl. 128-24.00A.

Reichelt, Helmut: *See*—
Hansen, Guenter; Lamm, Gunther; Reichelt, Helmut; and Schefczik, Ernst, 4,960,873, Cl. 534-765.000.

Reichert, Sylvie: *See*—
Loegel, Charles; Durr, Isabelle; Reichert, Sylvie; Loegel, Patrick; and Schneider, Francine, 4,960,176, Cl. 175-424.000.

Reid, Bruce A.: *See*—
Brooks, Ralf M.; Kallin, Fredrik L. N.; Marshall, Gary R.; and Reid, Bruce A., 4,960,336, Cl. 400-61.000.

Reif, Werner, to Motan Verfahrungstechnik GmbH & Co. Equipment for making and packing a multiple-constituent mixture. 4,959,947, Cl. 53-502.000.

Reilly, Frederick W., to Miranda Investments Limited. Connector for connecting hollow rectangular tubular members. 4,960,343, Cl. 403-171.000.

Reilly, John J.; and Kamel, Ihab L., to United States of America, Navy. Polymer composite preform and process for producing same. 4,960,818, Cl. 524-440.000.

Reinecke, Paul: *See*—
Holmwood, Graham; Kramer, Wolfgang; Regel, Erik; Elbe, Hans L.; Buchel, Karl H.; Dutzmann, Stefan; Brandes, Wilhelm; and Reinecke, Paul, 4,960,781, Cl. 514-383.000.

Reinhard, Michael. Strand cutter with bed knife that can be replaced during operation. 4,960,020, Cl. 83-34.000.

Reinhard, Michael. Device and method for the granulation of melting and softening materials. 4,960,547, Cl. 264-11.000.

Reinmuller, Johannes, to Merck Patent GmbH. Device for inserting in wounds and wound cavities. 4,960,415, Cl. 604-890.100.

Reiser, Wolf: *See*—
Zerbes, Rudolf; Linke, Siegfried W.; Mohrmann, Karl H.; and Reiser, Wolf, 4,960,911, Cl. 549-519.000.

Rembold, Manfred: *See*—
Husler, Rinaldo; Rutsch, Werner; Rembold, Manfred; and Sitek, Franciszek, 4,960,746, Cl. 502-153.000.

Renk Aktiengesellschaft: *See*—
Reppert, Rudi; and Zaunberger, Franz-Xaver, 4,960,404, Cl. 475-23.000.

Renner, Alfred: *See*—
Cotting, Jacques-Alain; and Renner, Alfred, 4,960,840, Cl. 525-521.000.

Renton, Stanley, to Albright & Wilson Limited. Deposition processes. 4,960,433, Cl. 8-506.000.

Rentzea, Costin; Ammermann, Eberhard; and Lorenz, Gisela, to BASF Aktiengesellschaft. Cyclic amines and fungicides containing them. 4,960,774, Cl. 514-239.200.

Renz, Gerhard, executor: *See*—
Obrist, Frank; Wankel, Felix H., deceased; Renz, Gerhard, executor; Meysen, Fried, executor; and Burkhardt, Thomas, executor, 4,960,370, Cl. 418-9.000.

REO Hydraulic Pierce & Form: *See*—
Obrecht, Robert E.; and Waltonen, Edward J., 4,959,989, Cl. 72-450.000.

Reppert, Rudi; and Zaunberger, Franz-Xaver, to Renk Aktiengesellschaft. Superposition steering system with integrated mechanical and infinitely variable drives. 4,960,404, Cl. 475-23.000.

Research Corporation Technologies: *See*—
Vestal, Marvin L.; Blakely, Calvin R.; and Fergusson, Gordon J., 4,960,992, Cl. 250-288.000.

Research-Cottrell: *See*—
Helfritch, Dennis J., 4,960,445, Cl. 55-5.000.

Ressel, Hans-Joachim: *See*—
Lachhein, Stephen; and Ressel, Hans-Joachim, 4,960,887, Cl. 544-320.000.

Reuter, Alfred; and Klumpp, Gunter, to Gebruder Linck Maschinenfabrik "Gatterlinck" GmbH & Co. KG. Cross-cut sawing of boards by saw blades mounted on transversely adjustable carriers. 4,960,023, Cl. 83-368.000.

Reylek, Robert S.: *See*—
Berg, James G.; and Reylek, Robert S., 4,960,490, Cl. 156-656.000.

Reynolds, Charles E.: *See*—
Davis, Wayne S.; Reynolds, Charles E.; and Whiteman, Robert N., Jr., 4,960,387, Cl. 439-374.000.
Frantz, Robert H.; Mosser, Benjamin H., III; Myers, Earl C., Jr.; and Reynolds, Charles E., 4,960,388, Cl. 439-404.000.
Frantz, Robert H.; Mosser, Benjamin H., III; Myers, Earl C., Jr.; and Reynolds, Charles E., 4,960,389, Cl. 439-404.000.

Rheem Manufacturing Company: *See*—
Shellenberger, Timothy J., 4,960,102, Cl. 126-110.00R.

Rhine, Geoffrey A.: *See*—
Wilson, Denney L.; Rhine, Geoffrey A.; and Elmquist, Thomas L., 4,961,077, Cl. 346-1.100.

Rhodes, Robert J. Aquatic trap funnel. 4,959,922, Cl. 43-100.000.

Rhone-Poulenc Agrochimie: *See*—
Borrod, Guy; and Gadras, Alain, 4,960,454, Cl. 71-92.000.

Rhone-Poulenc Chimie: *See*—
Billet, Lucien; and Lebrun, Jean-Jacques, 4,960,850, Cl. 528-23.000.

Rhone-Poulenc, Inc.: *See*—
Penny, Glenn S., 4,960,527, Cl. 252-8.551.

Rhone-Poulenc Sante: *See*—
Bourzai, Jean-Dominique; Capet, Marc; Cotrel, Claude; Labaudiniere, Richard; Pitchen, Philippe; and Roussel, Gerard, 4,960,779, Cl. 514-300.000.
Le Roy, Pierre; and Mandard-Cazin, Bernadette, 4,960,904, Cl. 549-34.000.

Rice, Camilla A., to ECC America Inc. Surface modified mineral compositions. 4,960,816, Cl. 524-425.000.

Rice, Craig; Morser, Michael J.; Glaser, Charles; and Donner, Peter A., to Codon. Methods for recovery of tissue plasminogen activator. 4,960,702, Cl. 435-226.000.

Rice, Edwin E.; and Norris, Hugh R., to Ingersoll-Rand Company. Friction control for bearing surface of roller. 4,960,202, Cl. 198-781.000.

Richardson, Kenneth: *See*—
Gymer, Geoffrey E.; and Richardson, Kenneth, 4,960,782, Cl. 514-383.000.

Richardson-Vicks Inc.: *See*—
Figueroa, Ramon, Jr.; Harrison, Bobby G., Jr.; and SaNogueira, James P., 4,960,764, Cl. 514-63.000.

Richter, Ekkehard: *See*—
Bruggendick, Hermann; Weber, Raimond; Richter, Ekkehard; and Knoppik, Berthold, 4,960,447, Cl. 55-390.000.

Richter Gedeon Vegyeszeti Gyar R.T.: *See*—
Vedres, Andras; Szantay, Csaba; Stefko, Bela; Kreidl, Janos; Nemes, Andras; Blasko, Gabor; Bogsch, Erik; Mathe, Denes; Hegedus, Istvan; Szuchovszky, Adrien, nee Gergely; and Mester, Tamas, 4,960,888, Cl. 544-323.000.

Ricoh Company, Ltd.: *See*—
Nakayama, Hiroshi; Kojima, Keiji; and Sato, Gen, 4,961,231, Cl. 382-21.000.
Ohno, Yoshimi; and Hatase, Takayuki, 4,960,986, Cl. 250-201.700.
Ohta, Wasaburo; Kinoshita, Mikio; and Katsuragawa, Tadao, 4,960,072, Cl. 118-723.000.

Sawada, Mitsuji, 4,961,185, Cl. 370-79.000.

Riddell, David: *See—*
Ashton, Michael J.; Bridge, Andrew W.; Dron, Donald I.; Fenton, Garry; Lythgoe, David J.; Newton, Christopher G.; Riddell, David; Smith, Christopher; and Stuttle, Keith A. J., 4,960,775, Cl. 514-248.000.

Riffaud, Jean-Pierre: *See—*
Danree, Bernard; Houziaux, Patrick; Lacolle, Jean-Yves; and Riffaud, Jean-Pierre, 4,960,900, Cl. 548-203.000.

Rigal, Dominique: *See—*
Cukier, Maurice; Pilost, Daniel; and Rigal, Dominique, 4,961,189, Cl. 370-112.000.

Rikagaku Kenkyusho: *See—*
Idesawa, Masanori, 4,961,096, Cl. 357-30.000.

Riley, Robert: *See—*
Brooks, Gary T.; Connolly, Brian C.; and Riley, Robert, 4,960,549, Cl. 264-45.500.

Ringsdorf, Helmut: *See—*
Erdelen, Christian; Ringsdorf, Helmut; Prass, Werner; and Scheunemann, Ude, 4,960,635, Cl. 428-220.000.

Rising, Rolf C., to Diaphon Development AB. Hearing aid programming interface. 4,961,230, Cl. 381-69.200.

Rizzetto, Pietro, to Industrie Zanussi SpA. Water flow distributor for a washing machine. 4,960,139, Cl. 137-625.460.

Rizzitiello, Gilberto, to F.A.D.I. Fabrica Aspirapolvere Domestic Industriali. Aspirator for liquid and solid substances, with sectional storage bin. 4,960,149, Cl. 137-205.000.

Robb, Richard A.; and Grubb, Michael J., to Herrules Equipment Corporation. Paint cleaning apparatus. 4,960,142, Cl. 134-138.000.

Robert Bosch GmbH: *See—*
Junginger, Erich; Schnaibel, Eberhard; and Schneider, Erich, 4,960,087, Cl. 123-198.00D.
Spitz, Richard; and Biallas, Vesna, 4,960,731, Cl. 437-152.000.

Roberts, Doris K.: *See—*
Young, Ilsa A.; and Roberts, Doris K., 4,960,204, Cl. 206-235.000.

Roberts, Gregory K.: *See—*
Williams, Roger O.; Kurtz, Milton C.; Godwin, Jimmy D.; Williams, Stephen P.; and Roberts, Gregory K., 4,961,123, Cl. 360-131.000.

Robertson, Jason L., to Hydro-Pac, Inc. Cylinder with sleeve compacter seals for high pressure pumps. 4,960,039, Cl. 92-165.00R.

Rockwell International Corporation: *See—*
Khoshnevisan, Mohsen; and Yeh, Pochi A., 4,960,322, Cl. 350-354.000.

Rodrigues, Renato S.; and Ogura, Jayme H., to Petroleo Brasileiro S.A. - PETROBRAS. Equipment for oil well drilling and completing operations in deep water. 4,960,174, Cl. 166-342.000.

Rodriguez-Cavazos, Enrique, to RCA Licensing Corporation. Dual power source output amplifier. 4,961,032, Cl. 315-397.000.

Roemer, Peter B.: *See—*
Park, John N.; Mueller, Otward M.; and Roemer, Peter B., 4,961,054, Cl. 324-322.000.

Roeska, Guenther; Winnerl, Josef; and Neppl, Franz, to Siemens Aktiengesellschaft. Method for self-aligned manufacture of contacts between interconnects contained in wiring levels arranged above one another in an integrated circuit. 4,960,489, Cl. 156-652.000.

Roggwiller, Peter, to Asea Brown Boveri Ltd. High-power GTO thyristor and also a method for its manufacture. 4,961,099, Cl. 357-38.000.

Rohm GmbH: *See—*
Christner, Juergen; Pfleiderer, Ernst; and Taeger, Tilman, 4,960,428, Cl. 8-94.180.

Rohm GmbH Chemische Fabrik: *See—*
Johann, Peter; and Winkler, Georg, 4,960,705, Cl. 435-272.000.

Rohm and Haas Company: *See—*
Bors, Daniel A.; and Emmons, William D., 4,960,924, Cl. 560-178.000.

Rokkaku, Kazuo: *See—*
Katayama, Eiichi; Ueda, Kouichi; Takebayashi, Hiroaki; and Rokkaku, Kazuo, 4,960,405, Cl. 475-183.000.

Rooyakkers, Michael L.; and Harvey, Ken E., to Valley Tissue Packaging, Inc. Folder. 4,959,945, Cl. 53-378.000.

Rope-O-Matic Systems Inc.: *See—*
Snorgrass, Patrick R.; and Martin, Gary K., 4,960,076, Cl. 119-29.000.

Roper, Robert L.: *See—*
Bolin, William D.; and Roper, Robert L., 4,959,896, Cl. 290-40.00B.

Rosbeck, Joseph P.; and Cockrum, Charles A., to Santa Barbara Research Center. Heterojunction photodiode array. 4,961,098, Cl. 357-30.000.

Roscher, Gunter: *See—*
Kleiner, Hans-Jerg; and Roscher, Gunter, 4,960,919, Cl. 558-142.000.

Rosco Manufacturing Company: *See—*
Larson, David L., 4,960,242, Cl. 239-168.000.

Rose, David: *See—*
Clausen, Thomas; and Rose, David, 4,960,955, Cl. 568-709.000.

Rosenberg, Lior. Surgical tissue separation system and surgical knife particularly useful therein. 4,960,419, Cl. 606-37.000.

Rosendahl, Gosta. Web-like fill element. 4,960,625, Cl. 428-35.300.

Rosenquist, Niles R., to General Electric Company. Method of making a polycarbonate cross-linked resin. 4,960,839, Cl. 525-462.000.

Rosenquist, Niles R., to General Electric Company. Polycarbonate cross-linked resin. 4,960,863, Cl. 528-480.000.

Rosenthal, Bert P.: *See—*
Baehr, G. Geoffrey; and Rosenthal, Bert P., 4,961,216, Cl. 379-57.000.

Ross, Bruce. Spinning top toy. 4,960,401, Cl. 446-256.000.

Roush, David M.; Shaw, Donald A.; Jones, Michael L.; and Chang, Jun H., to FMC Corporation. Pesticidal 2-fluoroethyl ethers. 4,960,884, Cl. 514-721.000.

Roussel, Gerard: *See—*
Bourzai, Jean-Dominique; Capet, Marc; Cotrel, Claude; Labaudiniere, Richard; Pitchen, Philippe; and Roussel, Gerard, 4,960,779, Cl. 514-300.000.

Rousset, Abel; Maachi, Belaid; Gilot, Bernard; and Gougeon, Michel, to Atochem. γ-Fe_2O_3/Fe_3O_4 spinels. 4,960,583, Cl. 423-633.000.

Rousset, Didier: *See—*
Provence, Marc; Rousset, Didier; and Dunand, Josiane, 4,959,913, Cl. 36-117.000.

Roussin, Michael A.; and Bargfrede, Brent C., to Caterpillar Inc. Impact bucket apparatus. 4,959,915, Cl. 37-141.00R.

Rowlands, John A.; Araj, Naoum; and Davis, Herbert J., to Noranda, Inc. System for measuring the charge distribution on a photoreceptor surface. 4,961,209, Cl. 378-29.000.

Royal Applicance Mfg. Co.: *See—*
Sovis, John F.; Saunders, Craig M.; Kopco, James J.; and Wright, Michael F., 4,959,885, Cl. 15-335.000.

Royston, James D.: *See—*
Wang, Xingwu; and Royston, James D., 4,960,760, Cl. 505-1.000.

Rubin, Wallace: *See—*
Hedges, Philip S.; and Rubin, Wallace, 4,960,236, Cl. 228-180.100.

Rucker, Joie. Method and apparatus for application of finger & toenail coatings. 4,960,587, Cl. 424-61.000.

Ruhrgas Aktiengesellschaft: *See—*
Jannemann, Theo; and Berg, Hans, 4,960,378, Cl. 431-114.000.

Rumley, Stuart D., to New DEST Corporation. Document scanner. 4,961,117, Cl. 358-461.000.

Russ, Werner H.: *See—*
Schlafer, Ludwig; Schwaiger, Gunther; and Russ, Werner H., 4,960,872, Cl. 534-642.000.

Rutsch, Werner: *See—*
Husler, Rinaldo; Rutsch, Werner; Rembold, Manfred; and Sitek, Franciszek, 4,960,746, Cl. 502-153.000.

Ryan, Alex. Movable safety cover for vehicle service pit. 4,960,150, Cl. 137-234.600.

Rydin, Arne O. T.: *See—*
Johansson, Hans V.; and Rydin, Arne O. T., 4,961,222, Cl. 379-413.000.

Ryobi Ltd.: *See—*
Mimura, Takashi; and Fujisawa, Nobuhiko, 4,960,049, Cl. 101-217.000.

S. C. Johnson & Son, Inc.: *See—*
Aiello, Salvatore F.; Brown, Jeffrey K.; Karasek, Donald F.; Lazzeroni, Edward J., Sr.; Lazzeroni, Edward J., Jr.; Quella, John F.; and Zollers, Timothy E., 4,959,923, Cl. 43-112.000.
Brown, Oliver M., 4,960,463, Cl. 106-11.000.
Martin, John, 4,959,924, Cl. 43-114.000.
Nelson, Kurt D.; Sus, Joseph E.; Lazzeroni, Edward J., Sr.; Zollers, Timothy E.; and Hanko, Jimmy J., 4,959,925, Cl. 43-125.000.

Sadler, Stephen J., to Jaguar Cars Limited. Air bag restraint systems. 4,960,292, Cl. 280-731.000.

Saeki, Hideo: *See—*
Ikeno, Masahiko; and Saeki, Hideo, 4,960,658, Cl. 430-7.000.

Saeki, Mitsuru: *See—*
Saho, Norihide; Nemoto, Takeo; Ogata, Hisanao; and Saeki, Mitsuru, 4,959,964, Cl. 62-51.100.

SAES Getters SpA: *See—*
della Porta, Paolo; Martelli, Daniele; Urso, Giuseppe; and Trivellato, Stefano, 4,961,040, Cl. 313-561.000.

Safe-T-Jack, Inc.: *See—*
Arzouman, Harry H.; and Slay, Clyde E., 4,960,264, Cl. 254-8.00B.

Safe T. V., Inc.: *See—*
Herlitz, Nils G.; Iglehart, Karl L.; and Sentell, John S., 4,961,111, Cl. 358-100.000.

Safeco Mfg. Limited: *See—*
Kalaam, Shaik M.; and Hughson, Gary W., 4,959,876, Cl. 2-93.000.

Saffran, Richard E., to Bose Corporation. Stereo electroacoustical transducing. 4,961,226, Cl. 381-24.000.

Sagai, Hitoshi; Nogata, Keiko; and Takahashi, Mamoru, to Toyo Jozo Co., Ltd. DNA having genetic information of L-α-glycerophosphate oxidase and application thereof. 4,960,877, Cl. 536-27.000.

Sagar, Brian; Hamlyn, Paul; and Wales, David, to Shirley Institute, The. Wound dressing. 4,960,413, Cl. 604-289.000.

Sagawa, Toshimasa: *See—*
Sonoi, Takehiro; Sagawa, Toshimasa; Yamada, Okimasa; and Mizuno, Tetsuya, 4,960,947, Cl. 508-399.000.

Sager, Thomas B., to Branson Ultrasonics Corporation. Method and apparatus for separating monofilaments forming a strand. 4,959,895, Cl. 28-282.000.

Sageshima, Akira; Ozaki, Tadashi; Kawasaki, Hirozi; and Masuda, Isao, to Kioritz Corporation. Centrifugal clutch. 4,960,194, Cl. 192-103.00B.

Sagou, Seiji, to Kabushiki Kaisha Toshiba. Method for preparing a shadow mask for a color picture tube. 4,960,659, Cl. 430-23.000.

Saho, Norihide; Nemoto, Takeo; Ogata, Hisanao; and Saeki, Mitsuru, to Hitachi, Ltd. Cryostat with refrigerator containing superconductive magnet. 4,959,964, Cl. 62-51.100.

Saito, Atsushi; and Maeda, Takeshi, to Hitachi, Ltd. Information retrieving system with level clamping. 4,961,182, Cl. 369-124.000.

Saito, Kenji: *See*—
Nakagiri, Takashi; Nishimura, Yukuo; Sakai, Kunihiro; Tomida, Yoshinori; Eguchi, Ken; and Saito, Kenji, 4,960,679, Cl. 430-335.000.

Saito, Koetsu: *See*—
Tanaka, Hideyuki; Saito, Koetsu; Sakai, Ikuo; and Kawabuchi, Masami, 4,961,176, Cl. 367-155.000.

Saito, Seiichi: *See*—
Tanaka, Hiromichi; Arai, Takao; Takeuchi, Toshifumi; and Saito, Seiichi, 4,961,204, Cl. 375-25.000.

Saito, Yasuhisa; Kamio, Kunimasa; Shibata, Mitsuhiro; Watanabe, Katsuya; Shiomi, Yutaka; and Ueda, Youichi, to Sumitomo Chemical Co., Ltd. Imide compound and composition containing the same. 4,960,860, Cl. 528-353.000.

Saito, Yoshikazu: *See*—
Ide, Akira; and Saito, Yoshikazu, 4,961,011, Cl. 307-446.000.

Saito, Yoshio; and Yoshino, Shigeo, to Kinugawa Rubber Industrial Co., Ltd. Die for profile extrusion. 4,960,375, Cl. 425-131.100.

Saito, Yoshio: *See*—
Matsuda, Shinichi; Saito, Yoshio; and Ishizaka, Hideo, 4,959,976, Cl. 62-271.000.

Saitoh, Manzoh; and Okamura, Kenji, to NEC Corporation. Semiconductor device having polycrystalline silicon resistor. 4,961,103, Cl. 357-59.000.

Sakai Chemical Industry Co., Ltd.: *See*—
Iwasaki, Susumu; Kamisaka, Shigefumi; Yamazaki, Iwao; and Hatanaka, Tutomu, 4,960,582, Cl. 423-632.000.

Sakai, Ikuo: *See*—
Tanaka, Hideyuki; Saito, Koetsu; Sakai, Ikuo; and Kawabuchi, Masami, 4,961,176, Cl. 367-155.000.

Sakai, Kazuo; Terayama, Takao; and Morikawa, Juichi, to Hitachi, Ltd. Hydrodynamic grooved bearing device. 4,961,122, Cl. 360-107.000.

Sakai, Kunihiro: *See*—
Nakagiri, Takashi; Nishimura, Yukuo; Sakai, Kunihiro; Tomida, Yoshinori; Eguchi, Ken; and Saito, Kenji, 4,960,679, Cl. 430-335.000.

Sakamoto, Mitsuo: *See*—
Yamada, Toshikazu; Kobori, Takuji; Sakamoto, Mitsuo; Maeda, Shozo; and Takahashi, Shinichi, 4,959,934, Cl. 52-167.00R.

Sakane, Kazuo: *See*—
Takaya, Takao; Sakane, Kazuo; Miyai, Kenzi; and Kawabata, Kohji, 4,960,766, Cl. 514-202.000.

Sakanoue, Kei; Ishii, Yoshio; and Hirano, Tsumoru, to Fuji Photo Film Co., Ltd. Silver halide color photographic material. 4,960,688, Cl. 430-548.000.

Sakuta, Koji; Kuwata, Satoshi; and Mori, Shigeru, to Shin-Etsu Chemical Co., Ltd. Organosilicon compounds. 4,960,898, Cl. 548-110.000.

Salam, Fathi M. A., to Board of Trustees operating Michigan State University. Programmable neural circuit implementable in CMOS very large scale integration. 4,961,005, Cl. 307-201.000.

Salituro, Francesco G.; Harrison, Boyd L.; and Baron, Bruce M., to Merrell Dow Pharmaceuticals Inc. Excitatory amino acid antagonists. 4,960,786, Cl. 514-419.000.

Salk Institute Biotechnology Industrial Associates, Inc., The: *See*—
Ellis, Steven B.; and Harpold, Michael M., 4,960,690, Cl. 435-6.000.
Wood, Willis A.; and Wondrack, Lillian M., 4,960,699, Cl. 435-166.000.

Salomon S.A.: *See*—
Provence, Marc; Rousset, Didier; and Dunand, Josiane, 4,959,913, Cl. 36-117.000.

Salte, Ragnal; and Thomassen, Magny S., to Norsk Hydro a.s. Feed additive and feed containing such additive. 4,960,795, Cl. 514-560.000.

Sam Yang Co., Ltd.: *See*—
Youn, Han S.; Dong, Kim, Il; and Gyu, Choi I., 4,960,812, Cl. 524-291.000.

Sambursky, Alexandr I.: *See*—
Gorodissky, Boris P.; and Sambursky, Alexandr I., 4,960,406, Cl. 494-9.000.

Samreth, Soth; Bellamy, Francois; and Millet, Jean, to Fournier Innovation et Synergie. Novel β-D-phenylthioxylosides, their method of preparation and their use as pharmaceuticals. 4,960,758, Cl. 514-24.000.

Samuelson, Carl E.: *See*—
Boyko, Christina M.; Johnston, Craig N.; Loomis, James R.; Samuelson, Carl E.; and Schumacher, Ricahrd A., 4,960,634, Cl. 428-220.000.

Samukawa, Koji: *See*—
Seki, Masaki; Samukawa, Koji; and Meguro, Hidenori, 4,961,041, Cl. 318-578.000.
Seki, Masaki; Samukawa, Koji; and Hanaoka, Osamu, 4,961,150, Cl. 364-474.290.

Sanchelima, Jesus: *See*—
Fernandez, Robert; and Sanchelima, Jesus, 4,961,215, Cl. 379-56.000.

Sandberg, L. Bogue: *See*—
DeBruine, Gordon R.; Haataja, Bruce A.; and Sandberg, L. Bogue, 4,960,553, Cl. 264-113.000.

Sanden Corporation: *See*—
Fukuda, Toshiyuki, 4,959,968, Cl. 62-155.000.
Higuchi, Teruo, 4,960,366, Cl. 417-222.000.
Takahashi, Yutaka; Harashima, Ikuo; Nakayama, Sunichi; Arai, Yasuyuki; Takayanagi, Yasushi; Sekiguchi, Ryoichi; Abe, Tomomitsu; and Hayakawa, Hiroshi, 4,960,228, Cl. 222-129.100.
Terauchi, Kiyoshi, 4,960,367, Cl. 417-222.000.

Sander, Craig S.: *See*—
Dixit, Pankaj; Sliwa, Jack; Klein, Richard K.; Sander, Craig S.; and Farnaam, Mohammad, 4,960,732, Cl. 437-192.000.

Sander, Keith D. Bicycle crank assembly. 4,960,013, Cl. 74-594.300.

Sanders, Irl R., III: *See*—
Tarr, Warren T., Jr.; and Sanders, Irl R., III, 4,960,417, Cl. 604-15.000.

Sanderson, John R.; and Marquis, Edward T., to Texaco Chemical Company. Manufacture of ketone derivatives of polyoxypropylene glycols. 4,960,948, Cl. 568-405.000.

Sandis, Stylianos: *See*—
Bailly, Jean-Claude A.; and Sandis, Stylianos, 4,960,741, Cl. 502-10.000.

Sandoz Ltd.: *See*—
Casciani, Robert V., 4,960,536, Cl. 252-174.190.

Sandstrom, Paul H.; and Friedman, Emil M., to Goodyear Tire & Rubber Company, The. Fast curing rubber blend. 4,960,819, Cl. 524-516.000.

SaNogueira, James P.: *See*—
Figueroa, Ramon, Jr.; Harrison, Bobby G., Jr.; and SaNogueira, James P., 4,960,764, Cl. 514-63.000.

Santa Barbara Research Center: *See*—
Rosbeck, Joseph P.; and Cockrum, Charles A., 4,961,098, Cl. 357-30.000.

Santa nee Singola, Ilona: *See*—
Szalay, Erzsebet; Lugosi, Gyorgy; Kallay, Tamas U.; Nad, Zsuzsanna; Jelinek, Istvan; Simonidesz, Vilmos; Gyory, Peter; Nagy, Lajos; Lugosi, Marta; Santa nee Singola, Ilona; Besenyei, Gabor; and Simandi, Laszlo , 4,960,913, Cl. 552-206.000.

Santel, Hans-Joachim: *See*—
Jelich, Klaus; Babczinski, Peter; Santel, Hans-Joachim; Schmidt, Robert R.; and Strang, Harry, 4,960,455, Cl. 71-92.000.

Sanwa Kagaku Kenkyusho Co., Ltd.: *See*—
Natori, Shunji, 4,960,756, Cl. 514-8.000.

Sanyo Electric Co., Ltd.: *See*—
Yamaoki, Toshihiko; Wakisaka, Kenichiro; Minami, Kouji; and Iwamoto, Masayuki, 4,961,094, Cl. 355-326.000.

Sanyo Shokuhin Kabushiki Kaisha: *See*—
Nagata, Zenji, 4,959,936, Cl. 53-252.000.

Saperstein, David D.: *See*—
Homola, Andrew M.; Lin, Li-Ju J.; and Saperstein, David D., 4,960,609, Cl. 427-38.000.

Sarda, Jean L. Multi-color variable format offset printing press. 4,960,048, Cl. 101-182.000.

Sarges, Reinhard: *See*—
Howard, Harry R., Jr.; and Sarges, Reinhard, 4,960,785, Cl. 514-411.000.

Sasagawa, Tutomu, to Toyo Jozo Kabushiki Kaisha. Method of enhancing growth and improving feed conversion ratio in animals and block for use therein. 4,960,589, Cl. 424-442.000.

Sasai, Yoichi: *See*—
Ishino, Masato; and Sasai, Yoichi, 4,961,198, Cl. 372-50.000.

Sasaki, Masami: *See*—
Suzuki, Yasuhiro; Mori, Sumio; Fujiyama, Eiji; and Sasaki, Masami, 4,960,073, Cl. 118-723.000.

Sasaki, Shoji; and Tabuchi, Kenji, to Hitachi, Ltd.; and Hitachi Automotive Engineering Co., Ltd. Engine control system. 4,960,092, Cl. 123-414.000.

Sasaki, Shoko: *See*—
Shiokawa, Kozo; Tsuboi, Shinichi; Sasaki, Shoko; Moriya, Koichi; Hattori, Yumi; and Shibuya, Katsuhiko, 4,960,780, Cl. 514-300.000.

Satake, Yoshikatsu; Yamamoto, Shinji; Kaneko, Takashi; Tada, Masahito; Kashiwadate, Ken; Mizuno, Toshiya; Endo, Hiroyuki; Katto, Takayuki; and Shiiki, Zenya, to Kureha Kagaku Kogho K.K., JPX. Poly (arylene thioether) block copolymer fibers and production process thereof. 4,960,555, Cl. 264-288.400.

Satake, Yoshikatsu; Yamamoto, Shinji; Kaneko, Takashi; Tada, Masahito; Kashiwadate, Ken; Mizuno, Toshiya; Endo, Hiroyuki; Katto, Takayuki; and Shiiki, Zenya, to Kureha Kagaku Kagyo K.K. Stretched poly(arylene thioether) block copolymer films and production process thereof. 4,960,806, Cl. 524-100.000.

Sato, Gen: *See*—
Nakayama, Hiroshi; Kojima, Keiji; and Sato, Gen, 4,961,231, Cl. 382-21.000.

Sato, Katsuyuki; Yanagisawa, Kazumasa; and Ono, Kunio, to Hitachi, Ltd. Dynamic RAM having a full size dummy cell. 4,961,166, Cl. 365-189.010.

Sato, Kazuharu: *See*—
Yamaya, Masaaki; Sato, Kazuharu; and Takahashi, Masayuki, 4,960,809, Cl. 524-188.000.

Sato, Kazuyuki, to Kabushiki Kaisha Toshiba. Microprocessor system having cache directory and cache memory and hardware for initializing the directory. 4,961,136, Cl. 364-200.000.

Sato, Noritada, to Fuji Electric Corporate Research & Development. Radiation or light detecting semiconductor element containing heavily doped p-type stopper region. 4,960,436, Cl. 437-3.000.

Sato, Seiichi: *See*—
Tanabe, Sohei; Sato, Seiichi; Kyotani, Yoshinori; Ohta, Tomio; and Uchida, Yasumi, 4,960,883, Cl. 540-575.000.

Sato, Shinichi; Fukasawa, Atsushi; Sato, Takuro; Shoji, Yasuo; Shiino, Haruhiro; Suzuki, Yukio; and Ando, Hiromi, to Oki Electric Industry Co., Ltd. Linear predictive coding analysing apparatus and bandlimiting circuit therefor. 4,961,160, Cl. 364-724.010.

Sato, Takuro: *See*—
Sato, Shinichi; Fukasawa, Atsushi; Sato, Takuro; Shoji, Yasuo; Shiino, Haruhiro; Suzuki, Yukio; and Ando, Hiromi, 4,961,160, Cl. 364-724.010.

Sato, Tokuji: *See*—
Cho, Michio; Aosaki, Ko; and Sato, Tokuji, 4,961,085, Cl. 354-295.000.

Sato, Toyohiko: *See*—
Kanai, Takao; Tanemoto, Kei; Kubo, Hiroshi; and Sato, Toyohiko, 4,960,734, Cl. 501-98.000.

Sato, Yoshimi: *See*—
Tanitsu, Katsuya; Nakayama, Muneo; and Sato, Yoshimi, 4,960,618, Cl. 427-226.000.

Satoh, Shinichi: *See*—
Arai, Masatoshi; and Satoh, Shinichi, 4,960,847, Cl. 528-32.000.

Sauer, Joe D.: *See*—
Smith, Kim R.; and Sauer, Joe D., 4,960,934, Cl. 564-298.000.

Saunders, Craig M.: *See*—
Sovis, John F.; Saunders, Craig M.; Kopco, James J.; and Wright, Michael F., 4,959,885, Cl. 15-335.000.

Sawada, Mitsuji, to Ricoh Company, Ltd. Method for controlling a terminal equipment coupled to an integrated services digital network and a terminal equipment based on the same. 4,961,185, Cl. 370-79.000.

Sawai, Toshihiko: *See*—
Watanabe, Mitsuo; and Sawai, Toshihiko, 4,960,997, Cl. 250-368.000.

Sayers, Richard C., to Ampex Corporation. Cassette storage basket. 4,960,214, Cl. 211-133.000.

Scarlata, Richard F.: *See*—
Wierszewski, Ronald R.; Scarlata, Richard F.; Acquaviva, Thomas; and Matysek, James F., 4,960,272, Cl. 271-3.100.

Schaake, Herbert F.; and Koestner, Roland J., to Texas Instruments Incorporated. Homogenization anneal of II-VI compounds. 4,960,728, Cl. 437-82.000.

Scharmer, Mona. Method and apparatus for solar heating fluid. 4,960,104, Cl. 126-416.000.

Scharpf, Lewis G.: *See*—
Buckholz, Lawrence L., Jr.; Farbood, Mohamad I.; Kossiakoff, Nicolas; Scharpf, Lewis G.; and Seitz, Eugene W., 4,960,603, Cl. 426-536.000.

Scheef, Hans-Volker: *See*—
Schleppinghoff, Bernhard; Malessa, Reiner; Gabel, Christian; Scheef, Hans-Volker; and Lux, Mathias, 4,960,961, Cl. 568-899.000.

Scheerhorn, Douglas, to Steelcase Inc. Drawer lock and interlock mechanism. 4,960,309, Cl. 312-221.000.

Schefczik, Ernst: *See*—
Bergmann, Udo; Dix, Johannes D.; Hansen, Guenter; Schefczik, Ernst; and Seybold, Guenther, 4,960,874, Cl. 534-791.000.
Hansen, Guenter; Lamm, Gunther; Reichelt, Helmut; and Schefczik, Ernst, 4,960,873, Cl. 534-765.000.

Scheldorf, Gary O.; Gordon, James F.; and Scheldorf, Owen H., to General Electric Company. Compressor with an isolated vane slot. 4,960,372, Cl. 418-63.000.

Scheldorf, Owen H.: *See*—
Scheldorf, Gary O.; Gordon, James F.; and Scheldorf, Owen H., 4,960,372, Cl. 418-63.000.

Schepis, Dominic J.: *See*—
Lechaton, John S.; and Schepis, Dominic J., 4,960,726, Cl. 437-59.000.

Schering Aktiengesellschaft: *See*—
Biere, Helmut; Huth, Andreas; Rahtz, Dieter; Schmiechen, Ralph; Seidelmann, Dieter; Stephens, David; Engelstoft, Mogens; and Hansen, John B., 4,960,777, Cl. 514-253.000.
Vorbrueggen, Helmut; and Krolikiewicz, Konrad, 4,960,907, Cl. 549-336.000.

Schering Corporation: *See*—
Maag, Gustav A.; and Wells, John N., 4,960,244, Cl. 239-424.000.

Scherrer, Wilfried: *See*—
Baumeister, Peter; and Scherrer, Wilfried, 4,960,936, Cl. 564-417.000.

Scheunemann, Ude: *See*—
Erdelen, Christian; Ringsdorf, Helmut; Prass, Werner; and Scheunemann, Ude, 4,960,635, Cl. 428-220.000.

Scheurecker, Werner: *See*—
Eidinger, Helmut; and Scheurecker, Werner, 4,960,165, Cl. 164-491.000.

Schiffhauer, Earl J.: *See*—
Kaminski, Frank; and Schiffhauer, Earl J., 4,960,151, Cl. 137-376.000.

Schiller, Siegfried: *See*—
Neuman, Manfred; ZeiBig, Gerhard; Ihle, Karl-Heinz; Madler, Eckerhard; Schiller, Siegfried; and Schroller, Rudolf, 4,960,607, Cl. 427-8.000.

Schisler, H. Edmund: *See*—
O'Neill, Jeff S.; Schisler, H. Edmund; and Kubo, Isoroku, 4,960,080, Cl. 123-254.000.

Schlafer, Ludwig; Schwaiger, Gunther; and Russ, Werner H., to Hoechst Aktiengesellschaft. Water-soluble monoazopyrazolone dyestuffs having fiber reactive groups of the vinylsulfone series. 4,960,872, Cl. 534-642.000.

Schleppinghoff, Bernhard; Malessa, Reiner; Gabel, Christian; Scheef, Hans-Volker; and Lux, Mathias, to EC Erdolchemie GmbH. Process for the preparation of tert.-amyl alcohol (TAA). 4,960,961, Cl. 568-899.000.

Schlotzhauer, Robert A. Fuel shut-off valve. 4,960,145, Cl. 137-38.000.

Schlumberger Technology Corporation: *See*—
Parrott, Robert A.; and Lendermon, Gary M., 4,960,171, Cl. 166-55.000.

Schmale, Fred W.; and Oudelaar, Tone, to Applied Power Inc. Hydraulic actuating unit, in particular for raising a load, such as a hospital bed. 4,959,957, Cl. 60-413.000.

Schmid, Helmut: *See*—
Kloker, Werner; Freitag, Dieter; Uerdingen, Walter; Hess, Bernhard; and Schmid, Helmut, 4,961,179, Cl. 369-288.000.

Schmidt, Donald J., to Space Industries Partnership, L.P. Energy desaturation of electromechanical actuators used in satellite attitude control. 4,960,250, Cl. 244-164.000.

Schmidt-Kloiber, Heinz: *See*—
Reichel, Erich; Schmidt-Kloiber, Heinz; and Groke, Karl, 4,960,108, Cl. 128-24.00A.

Schmidt, Manfred: *See*—
Muller, Jurgen; Schmidt, Manfred; Wauer, Dieter; Zehetmaier, Thomas; Brys, Georges; Schoeters, Emile; Haug, Werner; and Bauer, Walter, 4,960,994, Cl. 250-327.200.

Schmidt, Robert R.: *See*—
Jelich, Klaus; Babczinski, Peter; Santel, Hans-Joachim; Schmidt, Robert R.; and Strang, Harry, 4,960,455, Cl. 71-92.000.

Schmidt, Steven P.: *See*—
Dubin, Alan S.; Looney, Catharine E.; and Schmidt, Steven P., 4,960,660, Cl. 430-49.000.

Schmiechen, Ralph: *See*—
Biere, Helmut; Huth, Andreas; Rahtz, Dieter; Schmiechen, Ralph; Seidelmann, Dieter; Stephens, David; Engelstoft, Mogens; and Hansen, John B., 4,960,777, Cl. 514-253.000.

Schmitter, Andre , to Shell Oil Company. Stabilized ethylene monoxide-olefin copolymers. 4,960,808, Cl. 524-151.000.

Schnaibel, Eberhard: *See*—
Junginger, Erich; Schnaibel, Eberhard; and Schneider, Erich, 4,960,087, Cl. 123-198.00D.

Schneider, Bruce H.; Schneider, Jerry S.; and Smith, Mark E., to Intellitek, Inc. Method and apparatus for marking and cutting a flexible web. 4,961,149, Cl. 364-469.000.

Schneider, Erich: *See*—
Junginger, Erich; Schnaibel, Eberhard; and Schneider, Erich, 4,960,087, Cl. 123-198.00D.

Schneider, Francine: *See*—
Loegel, Charles; Durr, Isabelle; Reichert, Sylvie; Loegel, Patrick; and Schneider, Francine, 4,960,176, Cl. 175-424.000.

Schneider, Jerry S.: *See*—
Schneider, Bruce H.; Schneider, Jerry S.; and Smith, Mark E., 4,961,149, Cl. 364-469.000.

Schneider, Werner, to Dango & Dienenthal Maschinenbau GmbH. Process and apparatus for opening furnace tapholes. 4,960,379, Cl. 432-3.000.

Schneiter, John L., to General Electric Company. Method and apparatus for acoustic breakthrough detection. 4,960,970, Cl. 219-121.600.

Schnell, Kenneth R.; and Slater, William E., to Hubbell Incorporated. Quick set grounding assembly. 4,960,964, Cl. 174-51.000.

Schoen, Erhard: *See*—
Littke, Walter; and Schoen, Erhard, 4,960,572, Cl. 422-245.000.

Schoeneberg, Carl M. Platform construction. 4,959,941, Cl. 52-664.000.

Schoeters, Emile: *See*—
Muller, Jurgen; Schmidt, Manfred; Wauer, Dieter; Zehetmaier, Thomas; Brys, Georges; Schoeters, Emile; Haug, Werner; and Bauer, Walter, 4,960,994, Cl. 250-327.200.

Schofield, John M. S., to U.S. Philips Corporation. Chirp pulse echo ranging apparatus. 4,960,329, Cl. 356-5.000.

Schofield, Peter R.: *See*—
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Scholl, Hans J.; and Pedain, Josef, to Bayer Aktiengesellschaft. Process for the production of polyisocyanates containing isocyanurate groups and their use. 4,960,848, Cl. 528-48.000.

Scholz, John A.: *See*—
White, Robert S.; Wyner, Elliot F.; and Scholz, John A., 4,961,019, Cl. 313-25.000.

Schopp, Richard: *See*—
Muller, Hans C.; and Schopp, Richard, 4,960,010, Cl. 74-640.000.

Schortmann, Walter E.: *See*—
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Schotter, Daniel K., to Hughes Aircraft Company. Fiber gauging guide for an in-line optical fiber adhesive applicator. 4,960,068, Cl. 118-123.000.

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Neuman, Manfred; ZeiBig, Gerhard; Ihle, Karl-Heinz; Madler, Eckerhard; Schiller, Siegfried; and Schroller, Rudolf, 4,960,607, Cl. 427-8.000.

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Schulze, Manfred: *See*—
Eckardt, Klaus; Toepfer, Gottfried; Seifert, Andreas; Schulze, Manfred; Funke, Udo; Stepanauskas, Marlena, deceased; Stepanauskas, Leonas-Vitas, legal representative; Stepanauskas, Daina, legal representative; Thrum, Heinz, deceased; Thrum, Margot, legal representative; Thrum, Mathias, legal representative; and Thrum, Meichael, legal representative, 4,960,694, Cl. 435-13.000.

Schumacher, Ernest W.: *See*—
Tanaka, Hazime; and Schumacher, Ernest W., 4,959,973, Cl. 62-225.000.

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Portugall, Michael; Schumacher, Franz; and Seiler, Erhard, 4,960,552, Cl. 264-108.000.

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Schumacher, Ricahrd A.: *See*—
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Astheimer, Hans; Friedmann, Hans; and Schuy, Hubert, 4,961,121, Cl. 360-103.000.

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Mueller, Michael W.; Hoppe, Kalus-Dieter; Schwab, Ekkehard; Steck, Werner; Auweter, Helmut; and Feser, Rainer, 4,960,462, Cl. 75-252.000.

Schwaha, Karl: *See*—
Rametsteiner, Hermann; Schwaha, Karl; Hirschmanner, Franz; and Bramerdorfer, Heinz, 4,960,164, Cl. 164-480.000.

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Schlafer, Ludwig; Schwaiger, Gunther; and Russ, Werner H., 4,960,872, Cl. 534-642.000.

Schwamborn, Michael: *See*—
Beck, Gunther; Baasner, Bernd; Schwamborn, Michael; and Brandes, Wilheim, 4,960,899, Cl. 598-186.000.

Schwartz, Paul A.: *See*—
Cullinan, Ann M.; and Schwartz, Paul A., 4,960,682, Cl. 430-393.000.

Schwartz, Willis T., to Occidental Chemical Corporation. Phenoxy phthalic anhydrides. 4,960,905, Cl. 549-243.000.

Schwarz, Dieter; and Kauschke, Hans-Dieter, to U.S. Philips Corporation. Arrangements for producing and recognizing information identifying non-occupied transmision paths in a digital transmission system. 4,961,180, Cl. 370-110.100.

Schwarz, James A.; Noh, Joong S.; and Agarwal, Rajiv K., to Syracuse University. Selection and preparation of activated carbon for fuel gas storage. 4,960,450, Cl. 62-18.000.

Scientific Generics Limited: *See*—
Pettigrew, Robert M.; Chambers, Stephen H.; and Davies, Dafydd G., 4,960,651, Cl. 428-607.000.

Scitex Corporation Ltd.: *See*—
Pomerantz, Itzchak; Cohen-Sabban, Joseph; Bieber, Avigdor; Kamir, Josef; Katz, Mathew; and Nagler, Michael, 4,961,154, Cl. 364-522.000.

Scott, Alistair; and Clark, Peter F., to Isoworth Limited. Gas cylinder connector. 4,960,261, Cl. 251-148.000.

Scott, Ray V., Jr.: *See*—
House, David W.; and Scott, Ray V., Jr., 4,960,620, Cl. 427-385.500.

Scott, Terence A., to Leggett & Platt, Incorporated. Edge-reinforced spring bedding product. 4,960,267, Cl. 267-91.000.

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Theofilopoulos, Argyrios N.; Dixon, Frank J.; and Aguado-Celada, Maria-Teresa, 4,960,712, Cl. 436-501.000.

Seals, Robert L. Multipurpose automotive tool kit. 4,960,016, Cl. 81-177.400.

Sebag, Henri; and Beck, Irina, to L'Oreal. Benzoyl peroxide and quaternary ammonium based pharmaceutical and cosmetic compositions. 4,960,772, Cl. 514-231.200.

Sebring, John P., to Grady, John K. Medical patient support table. 4,960,271, Cl. 269-323.000.

Seeberg-Elverfeldt, Herbert. Erection aid. 4,960,113, Cl. 128-79.000.

Seegmiller, Ben L. Truss systems, components and methods for trussing arched mine roofs. 4,960,348, Cl. 405-259.000.

Segerson, Eugene E.: *See*—
Geist, Henry E.; and Segerson, Eugene E., 4,961,107, Cl. 357-81.000.

Sehr, Willibald; and Zarniko, Martin, to Moba-Electronic Gesellscharft fur Mobil-Automation mbH. Control sensor for a construction machine. 4,961,173, Cl. 367-96.000.

Seibles, Josette C.; and Matrick, Howard, to Du Pont de Nemours, E. I., and Company. Dry nonelectroscopic toners surface coated with organofunctional substituted fluorocarbon compounds. 4,960,677, Cl. 430-331.000.

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Eckardt, Klaus; Toepfer, Gottfried; Seifert, Andreas; Schulze, Manfred; Funke, Udo; Stepanauskas, Marlena, deceased; Stepanauskas, Leonas-Vitas, legal representative; Stepanauskas, Daina, legal representative; Thrum, Heinz, deceased; Thrum, Margot, legal representative; Thrum, Mathias, legal representative; and Thrum, Meichael, legal representative, 4,960,694, Cl. 435-13.000.

Seiki, Hiromichi, to Idemitsu Kosan Company Limited. Lubricating oil composition. 4,960,542, Cl. 252-565.000.

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Tamura, Fujio, 4,959,999, Cl. 73-755.000.

Seiko Instruments, Inc.: *See*—
Yonezawa, Akira, 4,961,003, Cl. 250-398.000.

Seikosha Co., Ltd.: *See*—
Tanaka, Sakae; and Watanabe, Yoshiaki, 4,960,719, Cl. 437-40.000.

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Koike, Yuzuru; Miyashita, Yukio; Akimoto, Yoshiaki; Seki, Yasunari; and Yahata, Isao, 4,960,094, Cl. 123-425.000.

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Sekihara, Kiyoshi: *See*—
Yoshitomi, Toshihiko; Yushina, Heihachi; Horiuchi, Hiromi; Yamaguchi, Yukio; Kamoshita, Yasuo; and Sekihara, Kiyoshi, 4,960,668, Cl. 430-122.000.

Sekikawa, Katsuhide, to Mitsubishi Denki Kabushiki Kaisha. Graphics display method for numerical control apparatus. 4,961,072, Cl. 340-731.000.

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Hashimoto, Mitsuharu; and Takeda, Shinji, 4,960,262, Cl. 251-315.000.

Selig Sealing Products, Inc.: *See*—
Giles, Joseph M., 4,960,216, Cl. 215-232.000.

Sellergren, Borje; Ekberg, Bjorn A.; Albertsson, Per-Ake; and Mosbach, Klaus. Chiral two-phase system and method for resolution of racemic mixtures and separation of diastereomers. 4,960,762, Cl. 514-57.000.

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Yamazaki, Shumpei, 4,960,751, Cl. 505-1.000.

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Seno, Kaoru: *See*—
Narisada, Masayuki; Ohtani, Mitsuaki; Watanabe, Fumihiko; Hagishita, Sanji; Seno, Kaoru; Kamata, Susumu; Haga, Nobuhiro; Tsuri, Tatsuo; Tsushima, Tadahiko; and Kawada, Kenji, 4,960,909, Cl. 549-463.000.

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Herlitz, Nils G.; Iglehart, Karl L.; and Sentell, John S., 4,961,111, Cl. 358-100.000.

Seurre, Jean-Michel: *See*—
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Sevini, Franco; and Noristi, Luciano, to Hilmont Incorporated. Process for preparing thermally stable olefinic polymers. 4,960,593, Cl. 524-99.000.

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Jeffers, Cecil W.; and Sewcyk, Richard, 4,959,894, Cl. 28-104.000.

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Bergmann, Udo; Dix, Johannes D.; Hansen, Guenter; Schefczik, Ernst; and Seybold, Guenther, 4,960,874, Cl. 534-791.000.

Shah, Vatsal M.: *See*—
Pasternak, Mordechai; Bartels, Craig R.; Reale, John, Jr.; and Shah, Vatsal M., 4,960,519, Cl. 210-640.000.

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Wu, Stephen H. W.; Greene, Carol J.; and Sharma, Mahendra K., 4,960,814, Cl. 524-312.000.

Shaw, Daniel C.: *See*—
Bauer, Albert H.; and Shaw, Daniel C., 4,960,248, Cl. 242-55.530.

Shaw, Donald A.: *See*—
Roush, David M.; Shaw, Donald A.; Jones, Michael L.; and Chang, Jun H., 4,960,884, Cl. 514-721.000.

Shaw, Michael, to Dunlop Limited. Golf balls. 4,960,282, Cl. 273-232.000.

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Sheldon, Dunstan P. Dual printer system. 4,960,338, Cl. 400-636.100.

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Blytas, George C.; Diaz, Zaida; and Hart, William W. C., 4,960,865, Cl. 528-499.000.
Chatterjee, Ananda M.; and Wilpers, Dale J., 4,960,617, Cl. 427-222.000.
Dewhirst, Kenneth C., 4,960,912, Cl. 549-556.000.
Drent, Eit, 4,960,857, Cl. 528-271.000.
Drent, Eit, 4,960,906, Cl. 549-273.000.
Drent, Eit, 4,960,926, Cl. 560-233.000.
Evans, Wayne E.; and Blytas, George C., 4,960,507, Cl. 208-254.00R.
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Gergen, William P.; and Hart, William W. C., 4,960,838, Cl. 525-426.000.
Hwo, Charles C., 4,960,820, Cl. 524-528.000.
Kemp, Richard A., 4,960,952, Cl. 568-618.000.
Minderhoud, Johannes K.; and Lucien, Jacques, 4,960,505, Cl. 208-143.000.
Schmitter, Andre , 4,960,808, Cl. 524-151.000.
Smutny, Edgar J., 4,960,807, Cl. 524-147.000.
Van Doorn, Johannes A.; Wife, Richard L.; and Budzelaar, Petrus H. M., 4,960,747, Cl. 502-167.000.
Willis, Carl L.; Conway, Michael F.; and Martin, Michael K., 4,960,831, Cl. 525-250.000.
Wong, Pui-Kwan, 4,960,956, Cl. 568-722.000.

Shellenberger, Timothy J., to Rheem Manufacturing Company. Fuel-fired condensing type forced air heating furnace. 4,960,102, Cl. 126-110.00R.

Shelton, John F.: *See*—
Obermeyer, John R., Jr.; Shelton, John F.; and Williamson, Donald A., 4,961,013, Cl. 307-480.000.

Shemenski, Robert M.: *See*—
Kim, Dong K.; and Shemenski, Robert M., 4,960,473, Cl. 148-12.00B.

Shemitz, Sylvan R.; and Brygger, Flemming, to Sylvan R. Shemitz Associates, Inc. Lamp socket mounting bracket. 4,961,127, Cl. 362-285.000.

Shengqiao, Fu. Bioclock calculating device for human body. 4,960,980, Cl. 235-78.0RC.

Shepherd, Lloyd: *See*—
Dentini, Mark S.; Fulton, Joe A.; Jin, Sungho; Mottine, John J., Jr.; Shepherd, Lloyd; and Sherwood, Richard C., 4,960,612, Cl. 427-47.000.

Sherwood, Richard C.: *See*—
Dentini, Mark S.; Fulton, Joe A.; Jin, Sungho; Mottine, John J., Jr.; Shepherd, Lloyd; and Sherwood, Richard C., 4,960,612, Cl. 427-47.000.

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Alexandrov, Maxim L.; Belenky, Boris G.; Gotlib, Vladimir A.; Vlasov, Arkady P.; Komarov, Nikolai N.; Sudiiin, Valery V.; and Shevkunov, Vsevolod V., 4,960,516, Cl. 210-198.200.

Shibahara, Itaru: *See*—
Okuda, Takanari; Nomura, Shigeo; Shibahara, Itaru; Tateishi, Yoshinori; Hirano, Susumu; Teranishi, Hiroshi; Fujiwara, Masayuki; and Nishida, Toshio, 4,960,562, Cl. 376-416.000.

Shibata, Mitsuhiro: *See*—
Saito, Yasuhisa; Kamio, Kunimasa; Shibata, Mitsuhiro; Watanabe, Katsuya; Shiomi, Yutaka; and Ueda, Youichi, 4,960,860, Cl. 528-353.000.

Shibuya, Katsuhiko: *See*—
Shiokawa, Kozo; Tsuboi, Shinichi; Sasaki, Shoko; Moriya, Koichi; Hattori, Yumi; and Shibuya, Katsuhiko, 4,960,780, Cl. 514-300.000.

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Shiga, Norio, to Juki Corporation. Ink feeding mechanism for ink jet printers. 4,961,081, Cl. 346-140.00R.

Shigenaka, Makoto, to Mazda Motor Corporation. Method of processing and transferring vehicle body members with a robot. 4,960,969, Cl. 219-91.200.

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Shigyo, Masao; and Asai, Eiichi, to Fuji Photo Film Co., Ltd. Radiating image read-out and displaying apparatus. 4,960,993, Cl. 250-327.200.

Shiiki, Zenya: *See*—
Satake, Yoshikatsu; Yamamoto, Shinji; Kaneko, Takashi; Tada, Masahito; Kashiwadate, Ken; Mizuno, Toshiya; Endo, Hiroyuki; Katto, Takayuki; and Shiiki, Zenya, 4,960,555, Cl. 264-288.400.
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Shiino, Haruhiro: *See*—
Sato, Shinichi; Fukasawa, Atsushi; Sato, Takuro; Shoji, Yasuo; Shiino, Haruhiro; Suzuki, Yukio; and Ando, Hiromi, 4,961,160, Cl. 364-724.010.

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Tsubata, Yukihiro; and Shiino, Masaru, 4,960,350, Cl. 406-84.000.

Shike, Toyohiko: *See*—
Takematsu, Tetsuo; Yoneyama, Kouichi; Jikihara, Tetsuo; Katsurada, Manabu; Shike, Toyohiko; Hosokawa, Akemi; Mikami, Emiko; and Ikeda, Osamu, 4,960,897, Cl. 546-346.000.

Shimada, Junichi; Kobayashi, Kazutoshi; Moriyama, Norio; and Kawakami, Kazuhiko, to Hitachi, Ltd. Distributor for internal combustion engine. 4,960,099, Cl. 123-647.000.

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Kato, Hisaaki; Yamaguchi, Hiroshi; Mori, Hideshi; and Shimano, Akira, 4,959,952, Cl. 57-261.000.

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Nagano, Masashi, 4,960,403, Cl. 474-213.000.

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Shimbo, Masafumi. Method of growing compound semiconductor thin film using multichamber smoothing process. 4,960,720, Cl. 437-105.000.

Shimizu, Keiichi; Inui, Kenichi; and Aoike, Nanjou, to Toshiba Electric Equipment Corporation. Discharge lamp lighting device. 4,961,029, Cl. 315-219.000.

Shimizu, Toyokazu: *See*—
Fujisawa, Atsuhisa; Ojima, Masuo; Wakabayashi, Kenji; Omoto, Souji; and Shimizu, Toyokazu, 4,960,611, Cl. 427-43.100.

Shimizu, Yukiharu: *See*—
Hihara, Toshio; and Shimizu, Yukiharu, 4,960,871, Cl. 534-635.000.

Shin-Etsu Chemical Co., Ltd.: *See*—
Arai, Masatoshi; and Satoh, Shinichi, 4,960,847, Cl. 528-32.000.
Konno, Hiroki; Yamamoto, Yasushi; and Sonegawa, Shigehisa, 4,960,918, Cl. 556-425.000.
Sakuta, Koji; Kuwata, Satoshi; and Mori, Shigeru, 4,960,898, Cl. 548-110.000.
Yamaya, Masaaki; Sato, Kazuharu; and Takahashi, Masayuki, 4,960,809, Cl. 524-188.000.

Shin, Yasuhiro; and Kobayashi, Kazuo, to Oki Electric Industry Co., Ltd. MOS current switching circuit. 4,961,015, Cl. 307-572.000.

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Saito, Yasuhisa; Kamio, Kunimasa; Shibata, Mitsuhiro; Watanabe, Katsuya; Shiomi, Yutaka; and Ueda, Youichi, 4,960,860, Cl. 528-353.000.

Shionogi & Co., Ltd.: *See*—
Narisada, Masayuki; Ohtani, Mitsuaki; Watanabe, Fumihiko; Hagishita, Sanji; Seno, Kaoru; Kamata, Susumu; Haga, Nobuhiro; Tsuri, Tatsuo; Tsushima, Tadahiko; and Kawada, Kenji, 4,960,909, Cl. 549-463.000.
Uyeo, Shoichiro, 4,960,879, Cl. 540-200.000.
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Shippy, David J.: *See*—
Pechanek, Gerald G.; Shippy, David J.; Snedaker, Mark C.; and Woodward, Sandra S., 4,961,140, Cl. 364-200.000.

Shirahata, Tatsuo: *See*—
Imamura, Tetsuo; Shirahata, Tatsuo; and Shoji, Kichiro, 4,960,958, Cl. 568-806.000.

Shirk, Michael E.: *See*—
Davis, Wayne S.; Shirk, Michael E.; and Whiteman, Robert N., Jr., 4,960,390, Cl. 439-459.000.

Shirk, Steven H.: *See*—
Cognevich, Michael L.; and Shirk, Steven H., 4,960,173, Cl. 166-241.000.

Shirley Institute, The: *See*—
Sagar, Brian; Hamlyn, Paul; and Wales, David, 4,960,413, Cl. 604-289.000.

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Imamura, Tetsuo; Shirahata, Tatsuo; and Shoji, Kichiro, 4,960,958, Cl. 568-806.000.

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Short, William T., to General Motors Corporation. Process for thermoforming multihued laminate films. 4,960,558, Cl. 264-510.000.

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Sukimoto, Minobu; Akiyoshi, Hitoshi; Taguchi, Seijiro; and Morita, Tadaaki, 4,960,096, Cl. 123-570.000.

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Katayama, Eiichi; Ueda, Kouichi; Takebayashi, Hiroaki; and Rokkaku, Kazuo, 4,960,405, Cl. 475-183.000.

Shubat, Alexander; and Cedar, Yoram, to WaferScale Integration, Inc. Decoder for a memory address bus. 4,961,172, Cl. 365-230.060.

Shukla, Kailash C.: *See*—
Nunes, Maurice; Grimanis, Michael P.; Hurley, James R.; and Shukla, Kailash C., 4,960,377, Cl. 431-12.000.

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Mukoyoshi, Shunichiro; Yamori, Tsunefumi; Shuku, Shigekazu; and Fujioka, Hironari, 4,960,638, Cl. 428-342.000.

Shurben, William S., to Ecostix Environmental Inc. Acid monitoring kit. 4,960,565, Cl. 422-61.000.

Shutske, Gregory M.; and Kapples, Kevin J., to Hoechst-Roussel Pharmaceuticals Inc. Isoxazolobenzoxazepines. 4,960,767, Cl. 514-211.000.

Siddiqi, Iqbal; and Mangan, Ciaron, to Intracel Corporation. System of reactants involving an apo-enzyme useful in immunological analysis

and a method for carrying out immuoassays with this system. 4,960,693, Cl. 435-7.000.
Sidot, Christian: *See*—
Christidis, Yani; and Sidot, Christian, 4,960,923, Cl. 560-170.000.
Siebe Gorman & Company Limited: *See*—
Constance-Hughes, Trevor, 4,960,120, Cl. 128-205.220.
Siecor Corporation: *See*—
McDowell, Harvey R.; and Blew, Douglas J., 4,960,266, Cl. 254-134.3PA.
Siemanowski, Werner: *See*—
Jakobson, Gerald; and Siemanowski, Werner, 4,960,953, Cl. 568-621.000.
Siemens Aktiengesellschaft: *See*—
Finkenzeller, Johann; and Hubert, Guenter, 4,961,000, Cl. 250-484.100.
Frank, Richard, 4,960,987, Cl. 250-213.0VT.
Roeska, Guenther; Winnerl, Josef; and Neppl, Franz, 4,960,489, Cl. 156-652.000.
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Nappa, Mario J.; Sievert, Allen C.; and Tong, Walter R., 4,960,951, Cl. 568-615.000.
Sigmon, Bernard E., to Motorola, Inc. Feedback stabilization loop. 4,961,058, Cl. 331-9.000.
Signode Corporation: *See*—
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Strange, Booth B. Ship-borne emergency oil containment system and method. 4,960,347, Cl. 405-63.000.
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Akahori, Takashi; and Nakayama, Satoshi, 4,960,071, Cl. 118-722.000.
Kuroda, Kouichi; Hayashi, Chihiro; and Nakasuji, Kazuyuki, 4,959,985, Cl. 72-97.000.
Minami, Ryohei, 4,960,914, Cl. 552-296.000.
Okuda, Takanari; Nomura, Shigeo; Shibahara, Itaru; Tateishi, Yoshinori; Hirano, Susumu; Teranishi, Hiroshi; Fujiwara, Masayuki; and Nishida, Toshio, 4,960,562, Cl. 376-416.000.
Sumitomo Special Metal Co., Ltd.: *See*—
Kageyama, Keisuke, 4,960,739, Cl. 501-137.000.
Sundstrand Corporation: *See*—
Kirchberg, Maurice A., Jr., 4,961,130, Cl. 363-41.000.
Sunnanvader, Lars; and Hartig, Tomas, to Joka Kathetertechnik GmbH. Shut-off valve for a liquid flow line or infusion device. 4,960,259, Cl. 251-7.000.
Suresh, Dev. D.; Grasselli, Robert K.; Ratka, Frances I.; and Brazdil, James F., to Standard Oil Company, The. Multiply promoted MN-SB oxide catalysts. 4,960,921, Cl. 558-325.000.
Sus, Joseph E.: *See*—
Nelson, Kurt D.; Sus, Joseph E.; Lazzeroni, Edward J., Sr.; Zollers, Timothy E.; and Hanko, Jimmy J., 4,959,925, Cl. 43-125.000.
Sussman, Lester. Portable transaction tracking device. 4,961,158, Cl. 364-709.040.
Sutherland, Robert M.: *See*—
Dore, Arthur M., Jr.; and Sutherland, Robert M., 4,960,143, Cl. 134-199.000.
Suttmeier, Robert F. Variable pitch propeller assembly. 4,960,397, Cl. 440-050.000.
Sutton, Bernard S. Shoulder rest for cellular-telephone handset. 4,961,223, Cl. 379-449.000.
Sutula, Raymond A.; and Wang, Frederick E., to United States of America, Navy. Pyrophoric alloy complexes. 4,960,564, Cl. 420-400.000.
Suzuki, Hiroyuki, to Casio Computer Co., Ltd. Structure of a device casing. 4,961,126, Cl. 361-398.000.
Suzuki, Kazuo: *See*—
Tachibana, Fusao; Ishikawa, Hideyuki; and Suzuki, Kazuo, 4,960,097, Cl. 123-494.000.
Suzuki, Kinya: *See*—
Masuda, Yoshitomo; Ogawa, Masao; Arai, Katsuhiko; Suzuki, Kinya; Fuse, Tadashi; and Amano, Tetsuro, 4,960,657, Cl. 429-194.000.
Suzuki, Masaaki: *See*—
Okutani, Takeshi; Nakata, Yoshinori; Suzuki, Masaaki; and Akiyama, Takeo, 4,960,573, Cl. 423-22.000.
Suzuki, Minoru, to Motorola, Inc. Pattern driven interrupt in a digital data processor. 4,961,067, Cl. 340-146.200.
Suzuki, Nobuharu: *See*—
Tunoda, Mituaki; and Suzuki, Nobuharu, 4,960,435, Cl. 8-526.000.
Suzuki, Syuzi: *See*—
Aida, Satoshi; Iwama, Nobuyuki; Suzuki, Syuzi; and Ishiguro, Akihiro, 4,960,107, Cl. 128-24.00A.
Suzuki, Takanori: *See*—
Mukai, Toshio; Yamashita, Yoshiro; and Suzuki, Takanori, 4,960,886, Cl. 544-35.000.
Suzuki, Takayuki: *See*—
Tohma, Koichi; Hasegawa, Tetsuo; Kushida, Naoki; Tamura, Yasuyuki; Yaegashi, Hisao; and Suzuki, Takayuki, 4,960,632, Cl. 428-212.000.
Suzuki, Yasuhiro; Mori, Sumio; Fujiyama, Eiji; and Sasaki, Masami, to Anelva Corporation. Microwave plasma treatment apparatus. 4,960,073, Cl. 118-723.000.
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Sato, Shinichi; Fukasawa, Atsushi; Sato, Takuro; Shoji, Yasuo; Shiino, Haruhiro; Suzuki, Yukio; and Ando, Hiromi, 4,961,160, Cl. 364-724.010.
Swan, Ellen L.: *See*—
Logsdon, Peter B.; Stachura, Leonard M.; Swan, Ellen L.; and Basu, Rajat S., 4,960,535, Cl. 252-171.000.
Swanson, Richard M.: *See*—
Sinton, Ronald A.; and Swanson, Richard M., 4,960,468, Cl. 136-259.000.
Swanson, Ronald J.: *See*—
Wittmer, Charles M.; and Swanson, Ronald J., 4,961,207, Cl. 377-43.000.
Swiontek, Anthony J., to James River Corporation. Package assembly including a multi-surface, microwave interactive tray. 4,960,598, Cl. 426-107.000.
Switlik Parachute Company, Inc.: *See*—
Switlik, Stanley, 4,960,483, Cl. 156-290.000.
Switlik, Stanley, to Switlik Parachute Company, Inc. Heat pressing apparatus for making an inflatable life vest and method for use thereof. 4,960,483, Cl. 156-290.000.
Sylvan R. Shemitz Associates, Inc.: *See*—
Shemitz, Sylvan R.; and Brygger, Flemming, 4,961,127, Cl. 362-285.000.
Syntex (U.S.A.) Inc.: *See*—
Clark, Robin D., 4,960,891, Cl. 546-48.000.
Syracuse University: *See*—
Schwarz, James A.; Noh, Joong S.; and Agarwal, Rajiv K., 4,960,450, Cl. 62-18.000.
Szalay, Erzsebet; Lugosi, Gyorgy; Kallay, Tamas U.; Nad, Zsuzsanna; Jelinek, Istvan; Simonidesz, Vilmos; Gyory, Peter; Nagy, Lajos; Lugosi, Marta; Santa nee Singola, Ilona; Besenyei, Gabor; and Simandi, Laszlo , to Chinoin Gyogyszer- es Vegyeszeti Termekek Gyara Rt. Process for the preparation of pharmaceutical compositions. 4,960,913, Cl. 552-206.000.
Szantay, Csaba: *See*—
Vedres, Andras; Szantay, Csaba; Stefko, Bela; Kreidl, Janos; Nemes, Andras; Blasko, Gabor; Bogsch, Erik; Mathe, Denes; Hegedus, Istvan; Szuchovszky, Adrien, nee Gergely; and Mester, Tamas, 4,960,888, Cl. 544-323.000.
Szinnyei, Eva: *See*—
Ecsery, Zoltan, deceased; Knoll, Jozsef; Somfai, Eva; Torok, Zoltan; Szinnyei, Eva; and Mozsolics, Karoly, 4,960,797, Cl. 514-654.000.

Szomor, Maria: *See*—
Korbonits, Dezso ; Heja, Gergely; Szomor, Maria; and Minker, Emil, 4,960,773, Cl. 514-234.210.
Szuchovszky, Adrien, nee Gergely: *See*—
Vedres, Andras; Szantay, Csaba; Stefko, Bela; Kreidl, Janos; Nemes, Andras; Blasko, Gabor; Bogsch, Erik; Mathe, Denes; Hegedus, Istvan; Szuchovszky, Adrien, nee Gergely; and Mester, Tamas, 4,960,888, Cl. 544-323.000.
Tabler, Charles P.; and Stein, Eric D., to Buckhorn, Inc.; and EKCO/-GLACO, Inc. Bakery tray with blind stacking and unstacking. 4,960,207, Cl. 206-507.000.
Tabuchi, Kenji: *See*—
Sasaki, Shoji; and Tabuchi, Kenji, 4,960,092, Cl. 123-414.000.
Tachibana, Fusao; Ishikawa, Hideyuki; and Suzuki, Kazuo, to Fuji Jukogyo Kabushiki Kaisha. Air-fuel'ratio control system for two-cycle engine. 4,960,097, Cl. 123-494.000.
Tada, Masahito: *See*—
Satake, Yoshikatsu; Yamamoto, Shinji; Kaneko, Takashi; Tada, Masahito; Kashiwadate, Ken; Mizuno, Toshiya; Endo, Hiroyuki; Katto, Takayuki; and Shiiki, Zenya, 4,960,555, Cl. 264-288.400.
Satake, Yoshikatsu; Yamamoto, Shinji; Kaneko, Takashi; Tada, Masahito; Kashiwadate, Ken; Mizuno, Toshiya; Endo, Hiroyuki; Katto, Takayuki; and Shiiki, Zenya, 4,960,806, Cl. 524-100.000.
Tada, Tetsuo; Takagi, Ryoichi; and Kohara, Masanobu, to Mitsubishi Denki Kabushiki Kaisha. Probing plate for wafer testing. 4,961,052, Cl. 324-158.00P.
Taeger, Tilman: *See*—
Christner, Juergen; Pfleiderer, Ernst; and Taeger, Tilman, 4,960,428, Cl. 8-94.180.
Taguchi, Seijiro: *See*—
Sukimoto, Minobu; Akiyoshi, Hitoshi; Taguchi, Seijiro; and Morita, Tadaaki, 4,960,096, Cl. 123-570.000.
Taguchi, Yoshio; Imai, Chichiro; and Imai, Yoshio, to Toa Nenryo Kogyo Kabushiki Kaisha. Aromatic compounds having sulfonyl groups. 4,960,903, Cl. 548-461.000.
Taguchi, Yoshio: *See*—
Ikeda, Sadao; and Taguchi, Yoshio, 4,960,548, Cl. 264-40.400.
Tahara, Kazuo: *See*—
Abukawa, Toshimi; Okuyama, Toshiaki; Tahara, Kazuo; Marumoto, Katsuji; Koterazawa, Toshiyuki; Hombu, Mitsuyuki; Takahashi, Tadashi; Ishikura, Hisatugu; Yamamura, Hirohisa; Tatsuzaki, Toru; Omae, Tsutomu; and Takamatsu, Shuichi, 4,960,178, Cl. 180-79.100.
Tahara, Tetsuya: *See*—
Moriwaki, Minoru; Abe, Masao; Mikashima, Hiroshi; and Tahara, Tetsuya, 4,960,770, Cl. 514-219.000.
Tajima, Ikuo; and Hasegawa, Hideo, to Tokai Kogyo Mishin Kabushiki Kaisha. Embroidering machine. 4,960,061, Cl. 112-103.000.
Takada, Shunji: *See*—
Nishikawa, Toshihiro; Takada, Shunji; and Hasebe, Kazunori, 4,960,689, Cl. 430-603.000.
Takagi, Ryoichi: *See*—
Tada, Tetsuo; Takagi, Ryoichi; and Kohara, Masanobu, 4,961,052, Cl. 324-158.00P.
Takagiwa, Hiroyuki: *See*—
Yamada, Hiroyuki; Takagiwa, Hiroyuki; Masaki, Hiroya; Kasuya, Takahira; Takahashi, Jiro; Uchida, Masafumi; and Ikeuchi, Satoru, 4,960,664, Cl. 430-109.000.
Takahashi, Jiro: *See*—
Yamada, Hiroyuki; Takagiwa, Hiroyuki; Masaki, Hiroya; Kasuya, Takahira; Takahashi, Jiro; Uchida, Masafumi; and Ikeuchi, Satoru, 4,960,664, Cl. 430-109.000.
Takahashi, Kozo; and Fujinawa, Yukio, to Communications Research Laboratory, Ministry of Posts & Telecommunications; and National Research Institute for Earth Science & Disaster Prevention, Science & Technology Agency. Method of predicting volcanic eruptions. 4,961,143, Cl. 364-421.000.
Takahashi, Mamoru: *See*—
Sagai, Hitoshi; Nogata, Keiko; and Takahashi, Mamoru, 4,960,877, Cl. 536-27.000.
Takahashi, Masayuki: *See*—
Yamaya, Masaaki; Sato, Kazuharu; and Takahashi, Masayuki, 4,960,809, Cl. 524-188.000.
Takahashi, Naomasa, to Kabushiki Kaisha Toshiba. Optical apparatus. 4,960,321, Cl. 350-255.000.
Takahashi, Noriyoshi: *See*—
Nishikawa, Masayuki; Komori, Yumiko; Yokoi, Masaki; Ono, Masato; Takahashi, Noriyoshi; Fukuda, Yuzuru; Yagi, Shigeru; and Karakida, Ken-ichi, 4,960,662, Cl. 430-64.000.
Takahashi, Shinichi: *See*—
Yamada, Toshikazu; Kobori, Takuji; Sakamoto, Mitsuo; Maeda, Shozo; and Takahashi, Shinichi, 4,959,934, Cl. 52-167.00R.
Takahashi, Shinya: *See*—
Marui, Kuniyoshi; Ishii, Takaaki; and Takahashi, Shinya, 4,961,212, Cl. 379-67.000.
Takahashi, Tadashi: *See*—
Abukawa, Toshimi; Okuyama, Toshiaki; Tahara, Kazuo; Marumoto, Katsuji; Koterazawa, Toshiyuki; Hombu, Mitsuyuki; Takahashi, Tadashi; Ishikura, Hisatugu; Yamamura, Hirohisa; Tatsuzaki, Toru; Omae, Tsutomu; and Takamatsu, Shuichi, 4,960,178, Cl. 180-79.100.
Takahashi, Tsutomu, to NEC Corporation. Speech recognition system utilizing IC cards for storing unique voice patterns. 4,961,229, Cl. 381-42.000.
Takahashi, Yutaka; Harashima, Ikuo; Nakayama, Sunichi; Arai, Yasuyuki; Takayanagi, Yasushi; Sekiguchi, Ryoichi; Abe, Tomomitsu; and Hayakawa, Hiroshi, to Sanden Corporation; and Kirin Brewery Co., Ltd. Portable post-mix beverage dispenser unit. 4,960,228, Cl. 222-129.100.
Takahira, Kenichi, to Mitsubishi Denki Kabushiki Kaisha. IC card with secure mass storage memory. 4,960,982, Cl. 235-382.000.
Takamatsu, Shuichi: *See*—
Abukawa, Toshimi; Okuyama, Toshiaki; Tahara, Kazuo; Marumoto, Katsuji; Koterazawa, Toshiyuki; Hombu, Mitsuyuki; Takahashi, Tadashi; Ishikura, Hisatugu; Yamamura, Hirohisa; Tatsuzaki, Toru; Omae, Tsutomu; and Takamatsu, Shuichi, 4,960,178, Cl. 180-79.100.
Takao, Hiromichi, to Asahi-Sieki Manufacturing Co., Ltd. Finger actuating device in a transfer press. 4,960,197, Cl. 198-621.000.
Takasaki, Shigeru, to NEC Corporation. Simulation capable of simultaneously simulating a logic circuit model in response to a plurality of input logic signals. 4,961,156, Cl. 364-578.000.
Takasugi, Hisashi: *See*—
Takaya, Takao; Takasugi, Hisashi; Masugi, Takashi; Yamanaka, Hideaki; and Kawabata, Kohji, 4,960,889, Cl. 544-329.000.
Takata, Susumu; and Murahashi, Mamoru, to Kabushiki Kaisha Kobe Seiko Sho. Reinforcing metal fibers. 4,960,649, Cl. 428-574.000.
Takaya, Takao; Sakane, Kazuo; Miyai, Kenzi; and Kawabata, Kohji, to Fujisawa Pharmaceutical Co., Ltd. Cephem compounds. 4,960,766, Cl. 514-202.000.
Takaya, Takao; Takasugi, Hisashi; Masugi, Takashi; Yamanaka, Hideaki; and Kawabata, Kohji, to Fujisawa Pharmaceutical Co., Ltd. 7-acylamino-3-vinylcephalosporanic acid derivatives and processes for the preparation thereof. 4,960,889, Cl. 544-329.000.
Takayama, Shyuichi: *See*—
Kubokawa, Hiroaki; Tsukaya, Takashi; Ueda, Yasuhiro; Nakamura, Takeaki; Ohshima, Yutaka; Hibino, Hiroki; Takayama, Shyuichi; and Hagino, Tadao, 4,960,106, Cl. 128-6.000.
Takayanagi, Takashi: *See*—
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Takayanagi, Yasushi: *See*—
Takahashi, Yutaka; Harashima, Ikuo; Nakayama, Sunichi; Arai, Yasuyuki; Takayanagi, Yasushi; Sekiguchi, Ryoichi; Abe, Tomomitsu; and Hayakawa, Hiroshi, 4,960,228, Cl. 222-129.100.
Takebayashi, Hiroaki: *See*—
Katayama, Eiichi; Ueda, Kouichi; Takebayashi, Hiroaki; and Rokkaku, Kazuo, 4,960,405, Cl. 475-183.000.
Takeda, Shinji: *See*—
Hashimoto, Mitsuharu; and Takeda, Shinji, 4,960,262, Cl. 251-315.000.
Takei, Takayuki: *See*—
Watanabe, Shoichi; Takei, Takayuki; Hayashi, Terumine; and Natabe, Takashi, 4,960,724, Cl. 437-51.000.
Takematsu, Tetsuo; Yoneyama, Kouichi; Jikihara, Tetsuo; Katsurada, Manabu; Shike, Toyohiko; Hosokawa, Akemi; Mikami, Emiko; and Ikeda, Osamu, to Mitsubishi Kasei Corporation. Herbicide containing 1-(halogenomethyl)-vinyl pyridines. 4,960,897, Cl. 546-346.000.
Takemoto, Katsuo: *See*—
Yazawa, Masahiko; Kaneko, Hiroshi; and Takemoto, Katsuo, 4,960,843, Cl. 526-262.000.
Takemoto, Yasuzi: *See*—
Nagasaki, Hideo; and Takemoto, Yasuzi, 4,960,833, Cl. 525-329.300.
Takenaka, Yuji, to Fuji Photo Film Co., Ltd. Device for reading positional information on photographic films. 4,961,086, Cl. 355-41.000.
Takeuchi, Shuichi: *See*—
Okabe, Kazuaki; Ishii, Hideyuki; Watanabe, Haruo; and Takeuchi, Shuichi, 4,960,849, Cl. 528-76.000.
Takeuchi, Toshifumi: *See*—
Tanaka, Hiromichi; Arai, Takao; Takeuchi, Toshifumi; and Saito, Seiichi, 4,961,204, Cl. 375-25.000.
Takeuchi, Yukihisa; and Hirota, Toshikazu, to NGK Insulators, Ltd. Thermally recording head using integrated mica as the spacer layer. 4,961,078, Cl. 346-76.0PH.
Takita, Tomohisa: *See*—
Kato, Kuniki; Takita, Tomohisa; Nishiyama, Shigeru; and Yamamura, Shosuke, 4,960,910, Cl. 549-510.000.
Talati, Kiritkumar: *See*—
Lackie, C. Willard; and Talati, Kiritkumar, 4,961,133, Cl. 364-200.000.
Talkington, Sherry R.; Abe, Susan S.; and Mijac, Marko D., to Procter & Gamble Company, The. Food or beverage compositions with altered flavored display. 4,960,602, Cl. 426-534.000.
Tam, Simon M.; Holler, Mark A.; and Castro, Hernan A., to Intel Corporation. Synapse cell employing dual gate transistor structure. 4,961,002, Cl. 307-201.000.
Tamayo, Juan H., to Pemco, Inc. Containment unit with plug. 4,960,346, Cl. 405-52.000.
Tambrands, Inc.: *See*—
Tarr, Warren T., Jr.; and Sanders, Irl R., III, 4,960,417, Cl. 604-15.000.
Tamiya, Fumiyuki; Kobayashi, Nobuaki; and Fukuoka, Mitsuhiro, to Kabushiki Kaisha SAKURAKUREPASU. Implement for applying liquid. 4,960,340, Cl. 401-186.000.
Tamura, Fujio, to Seiko Electronic Components Ltd. Vacuum gauge of thermo-conductive type with quartz oscillator. 4,959,999, Cl. 73-755.000.
Tamura, Yasuyuki: *See*—
Tohma, Koichi; Hasegawa, Tetsuo; Kushida, Naoki; Tamura, Yasuyuki; Yaegashi, Hisao; and Suzuki, Takayuki, 4,960,632, Cl. 428-212.000.

Tanabe, Sohei; Sato, Seiichi; Kyotani, Yoshinori; Ohta, Tomio; and Uchida, Yasumi, to Kowa Company, Ltd. Piperazines and homopiperazines. 4,960,883, Cl. 540-575.000.

Tanaka, Hazime; and Schumacher, Ernest W., to Fuji Koki Manufacturing Co., Ltd. Thermostatic expansion valve. 4,959,973, Cl. 62-225.000.

Tanaka, Hideo, to Pioneer Electronic Corporation. Chargeable program receiving limit setting system in two-way cable television system. 4,961,109, Cl. 358-84.000.

Tanaka, Hideyuki; Saito, Koetsu; Sakai, Ikuo; and Kawabuchi, Masami, to Matsushita Electric Industrial Co., Ltd. Ultrasonic probe. 4,961,176, Cl. 367-155.000.

Tanaka, Hiroaki, to Hayashi Tokei Kogyo Kabushiki Kaisha. Lighting equipment. 4,961,028, Cl. 315-91.000.

Tanaka, Hiromichi; Arai, Takao; Takeuchi, Toshifumi; and Saito, Seiichi, to Hitachi, Ltd. PCM signal generating/reproducing apparatus. 4,961,204, Cl. 375-25.000.

Tanaka, Osamu: *See*—
Wada, Toshiya; Tanaka, Osamu; Egawa, Takatoshi; Yoshida, Makato; Higuchi, Seizun; and Izaki, Teruaki, 4,960,652, Cl. 428-611.000.

Tanaka, Sakae; and Watanabe, Yoshiaki, to Seikosha Co., Ltd. Method for producing amorphous silicon thin film transistor array substrate. 4,960,719, Cl. 437-40.000.

Tanaka, Shinri: *See*—
Kawashima, Yasuhiko; Tanaka, Shinri; Kojima, Tamotsu; and Kagawa, Nobuaki, 4,960,686, Cl. 430-522.000.

Tanaka, Takashi; Imura, Satoshi; and Kida, Yasuji, to Tokuyama Soda Kabushiki Kaisha. Photochromic compounds. 4,960,678, Cl. 430-332.000.

Tanaka, Toshiaki; Kajimura, Takashi; Kawano, Toshihiro; and Ono, Yuichi, to Hitachi, Ltd. Semiconductor laser device. 4,961,197, Cl. 372-45.000.

Tanaka, Yoshiharu: *See*—
Aoki, Toyoaki; Kawakami, Kouji; Tanaka, Yoshiharu; and Hoshikawa, Hiroshi, 4,960,711, Cl. 436-124.000.

Tanemoto, Kei: *See*—
Kanai, Takao; Tanemoto, Kei; Kubo, Hiroshi; and Sato, Toyohiko, 4,960,734, Cl. 501-98.000.

Tang, Ching C.: *See*—
Law, Kam S.; Leung, Cissy; Tang, Ching C.; Collins, Kenneth S.; Chang, Mei; Wong, Jerry Y. K.; and Wang, David Nin-Kou, 4,960,488, Cl. 156-643.000.

Tanigawa, Shigeho; Iwasaki, Katsunori; and Nozawa, Yasuto, to Hitachi Metals, Ltd. Method of manufacturing magnetically anisotropic magnet materials and device for same. 4,960,469, Cl. 148-105.000.

Tanigawa, Shigeho: *See*—
Nozawa, Yasuto; Tanigawa, Shigeho; and Iwasaki, Katsunori, 4,960,474, Cl. 148-302.000.

Tanimoto, Shiro: *See*—
Yasuda, Yoshikazu; Tsubota, Kazuaki; and Tanimoto, Shiro, 4,960,479, Cl. 156-251.000.

Tanitsu, Katsuya; Nakayama, Muneo; and Sato, Yoshimi, to Tokyo Ohka Kogyo Co., Ltd. Process for formation of metal oxide film. 4,960,618, Cl. 427-226.000.

Taniura, Hiroshi, to Think Laboratory Co., Ltd. Optical beam splitting method and an optical beam splitting/modulation method. 4,960,320, Cl. 350-171.000.

Tape Inc.: *See*—
Newkirk, Raymond K.; and Holker, David G., 4,960,478, Cl. 156-228.000.

Tarr, Warren T., Jr.; and Sanders, Irl R., III, to Tambrands, Inc. Compact tampon applicator with improved interlock. 4,960,417, Cl. 604-15.000.

Tateishi, Yoshinori: *See*—
Okuda, Takanari; Nomura, Shigeo; Shibahara, Itaru; Tateishi, Yoshinori; Hirano, Susumu; Teranishi, Hiroshi; Fujiwara, Masayuki; and Nishida, Toshio, 4,960,562, Cl. 376-416.000.

Tatematsu, Masahito: *See*—
Kono, Michikata; Wada, Yoshiyuki; Kamihara, Tetuya; Tatematsu, Masahito; and Suda, Koichi, 4,960,089, Cl. 123-260.000.

Tatsuzaki, Toru: *See*—
Abukawa, Toshimi; Okuyama, Toshiaki; Tahara, Kazuo; Marumoto, Katsuji; Koterazawa, Toshiyuki; Hombu, Mitsuyuki; Takahashi, Tadashi; Ishikura, Hisatugu; Yamamura, Hirohisa; Tatsuzaki, Toru; Omae, Tsutomu; and Takamatsu, Shuichi, 4,960,178, Cl. 180-79.100.

Tatumi, Takumi: *See*—
Mimura, Munehiko; Tatumi, Takumi; Naito, Yasuo; and Katayama, Kazuyori, 4,960,182, Cl. 180-179.000.

Taylor, Eric B., to CTS Corporation. Fail-safe resistor. 4,961,065, Cl. 338-308.000.

Tech Development Inc.: *See*—
Coons, Terry L., 4,960,085, Cl. 123-179.00F.

Teel, Willis A.; and Christoff, James T., to United States of America, Navy. High data rate continuous wave towed sonar. 4,961,174, Cl. 367-97.000.

Tegal Corporation: *See*—
Krogh, Ole, 4,960,610, Cl. 427-39.000.

Tehrani, Nasser N. Rapid hair pH indication and solution therefor. 4,960,585, Cl. 424-7.100.

Teldix GmbH: *See*—
Muller, Hans C.; and Schopp, Richard, 4,960,010, Cl. 74-640.000.

Telectronics N.V.: *See*—
Maker, Philip J., 4,960,123, Cl. 128-419.00D.

Telefonaktiebolaget L M Ericsson: *See*—
Johansson, Hans V.; and Rydin, Arne O. T., 4,961,222, Cl. 379-413.000.

Tell, Peter. Vacuum ejector device. 4,960,364, Cl. 417-174.000.

Tempke, Linda M. Eyeglass case kit. 4,960,208, Cl. 206-581.000.

Tenenboim, Menahem: *See*—
Gantz, Josef; and Tenenboim, Menahem, 4,960,105, Cl. 126-437.000.

Teng, Hsieh-Yih. Balloon-type bottle sealer. 4,960,217, Cl. 215-271.000.

Teng, James Z.: *See*—
Cruz, Richard A.; Haderle, Donald J.; and Teng, James Z., 4,961,134, Cl. 364-200.000.

Tennant, Jerald L. Surgical instrument and method for cutting the lens of an eye. 4,960,418, Cl. 606-107.000.

Tentler, Michael L.; and Hightower, Michael L., to Spectrum Concepts, Inc. Power management in a microprocessor-controlled battery-powered telephone device. 4,961,220, Cl. 379-413.000.

Terane, Hideyuki: *See*—
Nakagawa, Shin-ichi; and Terane, Hideyuki, 4,961,191, Cl. 371-22.100.

Teranishi, Hiroshi: *See*—
Okuda, Takanari; Nomura, Shigeo; Shibahara, Itaru; Tateishi, Yoshinori; Hirano, Susumu; Teranishi, Hiroshi; Fujiwara, Masayuki; and Nishida, Toshio, 4,960,562, Cl. 376-416.000.

Terashima, Kazutaka; Kawachi, Masaru; and Yoshida, Hiroaki, to Kabushiki Kaisha Toshiba. Method for purifying group II–IV compound semiconductors. 4,960,721, Cl. 437-247.000.

Terauchi, Kiyoshi, to Sanden Corporation. Slant plate type compressor with variable displacement mechanism. 4,960,367, Cl. 417-222.000.

Terauchi, Takashi; Yoshida, Kazuo; Machida, Yoshihisa; Okubo, Nobuyuki; and Konai, Yutaka, to Kureha Kagaku Kogyo K.K. Process for the production of halobenzophenone derivatives. 4,960,945, Cl. 568-323.000.

Terayama, Takao: *See*—
Sakai, Kazuo; Terayama, Takao; and Morikawa, Juichi, 4,961,122, Cl. 360-107.000.

Terpstra, Daniel A., to Emerson Electric Co. Quick action band saw blade tensioning device. 4,960,026, Cl. 83-818.000.

Tesch, Gunter. Pillow having a removeable insert. 4,959,880, Cl. 5-434.000.

Teshima, Takeo: *See*—
Kakino, Yoshiaki; Ihara, Yukitoshi; Yonetani, Mitsuo; and Teshima, Takeo, 4,961,034, Cl. 318-600.000.

Teshima, Yutaka; and Onishi, Satoshi, to Tosoh Corporation. Process for producing vinylchloride monomer by pyrolysis of 1,2-dichloroethane. 4,960,963, Cl. 570-226.000.

Texaco Chemical Company: *See*—
Sanderson, John R.; and Marquis, Edward T., 4,960,948, Cl. 568-405.000.

Texaco Inc.: *See*—
Pasternak, Mordechai; Bartels, Craig R.; Reale, John, Jr.; and Shah, Vatsal M., 4,960,519, Cl. 210-640.000.

Texas Alkyls, Inc.: *See*—
Crapo, Clark C.; and Malpass, Dennis B., 4,960,878, Cl. 556-179.000.

Texas Instruments Incorporated: *See*—
Moroi, Masayuki, 4,960,298, Cl. 294-64.100.
Pinkham, Raymond; and Balistreri, Anthony M., 4,961,171, Cl. 365-230.050.
Schaake, Herbert F.; and Koestner, Roland J., 4,960,728, Cl. 437-82.000.
Tran, Hiep V., 4,961,168, Cl. 365-189.110.

Tharp, Charles E., to Tharp, Charles E. Diffuser mounting arrangement for waste water aeration systems. 4,960,546, Cl. 261-122.000.

Thatcher, Larry E.: *See*—
Nguyenphu, Myhong; and Thatcher, Larry E., 4,961,162, Cl. 364-748.000.

Thelen, Gerhard, to Huels Aktiengesellschaft. Process for the manufacture of alkynediols by reaction of ketones with acetylene. 4,960,959, Cl. 568-855.000.

Thelen, William G.; May, Rodney E.; and Gilbert, David L., to Aeroquip Corporation. Galvanic isolator conduit fitting. 4,960,296, Cl. 285-50.000.

Theofilopoulos, Argyrios N.; Dixon, Frank J.; and Aguado-Celada, Maria-Teresa, to Scripps Clinic and Research Foundation. System and method for complement pathway analysis. 4,960,712, Cl. 436-501.000.

Thermalloy Incorporated: *See*—
Jordan, William D.; and Clemens, Donald L., 4,961,125, Cl. 361-383.000.

Thermo King Corporation: *See*—
Havemann, Robert K.; Viegas, Herman H.; and DeGrego, Ricardo S., 4,960,088, Cl. 123-198.00D.

Thiele, Ulrich, to Davy McKee, AG. Process for the production of linear polyesters, particularly for films and foils. 4,960,915, Cl. 524-706.000.

Thiem, Gerhard, to GESTA Gesellschaft fur Stahlrohrgeruste mbH. Movable cradle. 4,960,185, Cl. 182-38.000.

Think Laboratory Co., Ltd.: *See*—
Taniura, Hiroshi, 4,960,320, Cl. 350-171.000.

Thiruvengada, Seshan: *See*—
Allen, Ralph D.; Thiruvengada, Seshan; Cesare, Frank C.; and Visser, Harry D., 4,960,829, Cl. 525-193.000.

Thomas, Nils I.; Tien, Albert F.; and Brown, Kenneth A., to ITT Corporation. Cathode for image intensifier tube having reduced veiling glare. 4,961,025, Cl. 313-524.000.

Thomas, Teresa M.: *See*—
Hammann, William A., IV; Liang, Rong-Chang; Thomas, Teresa M.; and Hipps, Jesse, Sr., 4,960,750, Cl. 503-214.000.
Thomassen, Magny S.: *See*—
Salte, Ragnal; and Thomassen, Magny S., 4,960,795, Cl. 514-560.000.
Thomson-Brandt Armements: *See*—
Dieval, Gerard, 4,960,055, Cl. 102-489.000.
Thomson Composants Microondes: *See*—
Fouche, Alain; and Malbe, Serge, 4,960,973, Cl. 219-121.640.
Thomson-CSF: *See*—
Ragotin, Jean-Claude, 4,960,487, Cl. 156-643.000.
Tinet, Claude, 4,961,183, Cl. 369-275.400.
Vieux, Gerard; Boisson, Daniel; de Groot, Paul; and Colomb, Gilbert-Rene , 4,960,608, Cl. 427-10.000.
Thorfam Corp.: *See*—
Thorndyke, Robert J., 4,960,353, Cl. 410-20.000.
Thorndyke, Robert J., to Thorfam Corp. Wheel anchoring harness for motor vehicle transportation systems. 4,960,353, Cl. 410-20.000.
Thorne, James M.: *See*—
Perkins, Raymond T.; Thorne, James M.; Knight, Larry V.; and Woodbury, Richard C., 4,960,486, Cl. 156-633.000.
Thrum, Heinz, deceased: *See*—
Eckardt, Klaus; Toepfer, Gottfried; Seifert, Andreas; Schulze, Manfred; Funke, Udo; Stepanauskas, Marlena, deceased; Stepanauskas, Leonas-Vitas, legal representative; Stepanauskas, Daina, legal representative; Thrum, Heinz, deceased; Thrum, Margot, legal representative; Thrum, Mathias, legal representative; and Thrum, Meichael, legal representative, 4,960,694, Cl. 435-13.000.
Thrum, Margot, legal representative: *See*—
Eckardt, Klaus; Toepfer, Gottfried; Seifert, Andreas; Schulze, Manfred; Funke, Udo; Stepanauskas, Marlena, deceased; Stepanauskas, Leonas-Vitas, legal representative; Stepanauskas, Daina, legal representative; Thrum, Heinz, deceased; Thrum, Margot, legal representative; Thrum, Mathias, legal representative; and Thrum, Meichael, legal representative, 4,960,694, Cl. 435-13.000.
Thrum, Mathias, legal representative: *See*—
Eckardt, Klaus; Toepfer, Gottfried; Seifert, Andreas; Schulze, Manfred; Funke, Udo; Stepanauskas, Marlena, deceased; Stepanauskas, Leonas-Vitas, legal representative; Stepanauskas, Daina, legal representative; Thrum, Heinz, deceased; Thrum, Margot, legal representative; Thrum, Mathias, legal representative; and Thrum, Meichael, legal representative, 4,960,694, Cl. 435-13.000.
Thrum, Meichael, legal representative: *See*—
Eckardt, Klaus; Toepfer, Gottfried; Seifert, Andreas; Schulze, Manfred; Funke, Udo; Stepanauskas, Marlena, deceased; Stepanauskas, Leonas-Vitas, legal representative; Stepanauskas, Daina, legal representative; Thrum, Heinz, deceased; Thrum, Margot, legal representative; Thrum, Mathias, legal representative; and Thrum, Meichael, legal representative, 4,960,694, Cl. 435-13.000.
Tien, Albert F.: *See*—
Thomas, Nils I.; Tien, Albert F.; and Brown, Kenneth A., 4,961,025, Cl. 313-524.000.
Tillman, Ennis L.: *See*—
Werner, Kurt; Krieger, Leo G.; Bewley, Wilbur C.; and Tillman, Ennis L., 4,960,446, Cl. 55-312.000.
Timken Company, The: *See*—
Otto, Dennis L.; and Dimit, Richard O., 4,960,335, Cl. 384-484.000.
Tinet, Claude, to Thomson-CSF. Optical disk arrangement with closed contours whose entire extent represents information. 4,961,183, Cl. 369-275.400.
Tjebben, Michael O., to Alcatel NA, Inc. Non-actuating relay driver tester. 4,961,051, Cl. 324-415.000.
TMC Corporation: *See*—
Stritzl, Karl; Hoffmann, Kurt; Freisinger, Henry; Janisch, Andreas; Brunnhuber, Egon; Zotter, Johann; Spitaler, Egelbert; Wladar, Helmut; Muhlberger, Reinhard; and Dapeci, Karl, 4,960,289, Cl. 280-630.000.
Toa Nenryo Kogyo K.K.: *See*—
Murata, Masahide; Imai, Masafumi; Furuhashi, Hiroyuki; Maruyama, Kouji; and Ueno, Hiroshi, 4,960,743, Cl. 502-121.000.
Toa Nenryo Kogyo Kabushiki Kaisha: *See*—
Taguchi, Yoshio; Imai, Chichiro; and Imai, Yoshio, 4,960,903, Cl. 548-461.000.
Tobita, Youichi: *See*—
Kumanoya, Masaki; Konishi, Yasuhiro; Dosaka, Katsumi; Komatsu, Takahiro; and Tobita, Youichi, 4,961,007, Cl. 307-296.200.
Tochigifujisangyo Kabushiki Kaisha: *See*—
Kurihara, Sakuo, 4,960,192, Cl. 192-67.00R.
Todo, Akira: *See*—
Toibana, Hisaharu; Kuroiwa, Mitsuyuki; and Todo, Akira, 4,960,627, Cl. 428-64.000.
Toepfer, Gottfried: *See*—
Eckardt, Klaus; Toepfer, Gottfried; Seifert, Andreas; Schulze, Manfred; Funke, Udo; Stepanauskas, Marlena, deceased; Stepanauskas, Leonas-Vitas, legal representative; Stepanauskas, Daina, legal representative; Thrum, Heinz, deceased; Thrum, Margot, legal representative; Thrum, Mathias, legal representative; and Thrum, Meichael, legal representative, 4,960,694, Cl. 435-13.000.
Tohma, Koichi; Hasegawa, Tetsuo; Kushida, Naoki; Tamura, Yasuyuki; Yaegashi, Hisao; and Suzuki, Takayuki, to Canon Kabushiki Kaisha. Thermal transfer material. 4,960,632, Cl. 428-212.000.
Toibana, Hisaharu; Kuroiwa, Mitsuyuki; and Todo, Akira, to Mitsui Petrochemical Industries, Ltd. Optical recording media and process for preparing same. 4,960,627, Cl. 428-64.000.
Toida, Shouji; Iwasaki, Kazunori; Goto, Toru; and Tsuchiya, Shigeru, to Nippon Sanso Kabushiki Kaisha. Plug body for a liquid container. 4,960,218, Cl. 215-311.000.
Tokai Kogyo Mishin Kabushiki Kaisha: *See*—
Tajima, Ikuo; and Hasegawa, Hideo, 4,960,061, Cl. 112-103.000.
Tokuyama Soda Kabushiki Kaisha: *See*—
Tanaka, Takashi; Imura, Satoshi; and Kida, Yasuji, 4,960,678, Cl. 430-332.000.
Tokyo Ohka Kogyo Co., Ltd.: *See*—
Tanitsu, Katsuya; Nakayama, Muneo; and Sato, Yoshimi, 4,960,618, Cl. 427-226.000.
Tolfree, Jill: *See*—
Shimazu, Ken-ichi; Patel, Jayanti; and Tolfree, Jill, 4,960,663, Cl. 430-70.000.
Tollgrade Communications, Inc.: *See*—
Kiko, Frederick J., 4,961,218, Cl. 379-347.000.
Tomida, Yoshinori: *See*—
Nakagiri, Takashi; Nishimura, Yukuo; Sakai, Kunihiro; Tomida, Yoshinori; Eguchi, Ken; and Saito, Kenji, 4,960,679, Cl. 430-335.000.
Tomikawa, Munehiro: *See*—
Hirota, Sadao; Kikuchi, Hiroshi; Yamauchi, Hitoshi; and Tomikawa, Munehiro, 4,960,595, Cl. 424-450.000.
Tomitaka, Kichinojo; Utsumi, Shigeo; and Koizumi, Masumi, to Diafoil Company, Limited. Biaxially oriented polyester film for floppy disk. 4,960,636, Cl. 428-220.000.
Tomlinson, Martin; and Bramwell, Jonathan R. Data modem system. 4,961,206, Cl. 375-39.000.
Tomoda, Akihiro: *See*—
Kasuya, Michio; and Tomoda, Akihiro, 4,961,091, Cl. 355-321.000.
Tonen Sekiyukagaku Kabushiki Kaisha: *See*—
Komatsu, Masato; Isoi, Masaaki; Baba, Isao; and Mikami, Takashi, 4,960,823, Cl. 525-89.000.
Tong, Walter R.: *See*—
Nappa, Mario J.; Sievert, Allen C.; and Tong, Walter R., 4,960,951, Cl. 568-615.000.
Torbov, Tsvetan I.; and Mason, Howard B., to Acurex Corporation. Enhanced sorbent injection combined with natural gas reburning for a sox control for coal fired boilers. 4,960,577, Cl. 423-242.000.
Torok, Zoltan: *See*—
Ecsery, Zoltan, deceased; Knoll, Jozsef; Somfai, Eva; Torok, Zoltan; Szinnyei, Eva; and Mozsolics, Karoly, 4,960,797, Cl. 514-654.000.
Torrington Company, The: *See*—
Faye, Bradley D.; Hilby, James A.; Alff, Denis; and Hajzler, Christian, 4,960,333, Cl. 384-448.000.
Toseland, Bernard A.: *See*—
Vedage, Gamini A.; Henderson, William W.; Toseland, Bernard A.; and Deeba, Michel, 4,960,941, Cl. 564-450.000.
Toshiba Electric Equipment Corporation: *See*—
Shimizu, Keiichi; Inui, Kenichi; and Aoike, Nanjou, 4,961,029, Cl. 315-219.000.
Toshio Mukai: *See*—
Mukai, Toshio; Yamashita, Yoshiro; and Suzuki, Takanori, 4,960,886, Cl. 544-35.000.
Tosoh Corporation: *See*—
Teshima, Yutaka; and Onishi, Satoshi, 4,960,963, Cl. 570-226.000.
Yazawa, Masahiko; Kaneko, Hiroshi; and Takemoto, Katsuo, 4,960,843, Cl. 526-262.000.
Towers, Christine M.: *See*—
Bryan, Philip S.; Lambert, Patrick M.; Towers, Christine M.; and Jarrold, Gregory S., 4,961,004, Cl. 250-483.100.
Towle, Ian D. H.; and Horner, Patrick J., to Raychem Limited. Preparation of organic polymers using organometallic terminated blocks to produce metal free block copolymers. 4,960,835, Cl. 525-398.000.
Towsend, Marvin S., to Genvention, Inc. Method of making and using microphones for recording telephone conversations. 4,960,018, Cl. 83-13.000.
Toyo Jozo Co., Ltd.: *See*—
Sagai, Hitoshi; Nogata, Keiko; and Takahashi, Mamoru, 4,960,877, Cl. 536-27.000.
Toyo Jozo Kabushiki Kaisha: *See*—
Sasagawa, Tutomu, 4,960,589, Cl. 424-442.000.
Toyoda Koki Kabushiki Kaisha: *See*—
Asano, Hiroaki, 4,960,011, Cl. 74-650.000.
Toyota Jidosha Kabushiki Kaisha: *See*—
Higuchi, Tetsuo; Yamaguchi, Sachio; Sugimura, You; Sugiura, Shinji; and Nakamura, Shigeru, 4,960,828, Cl. 525-162.000.
Ikeda, Sadao; and Taguchi, Yoshio, 4,960,548, Cl. 264-40.400.
Tran, Hiep V., to Texas Instruments Incorporated. Bipolar-CMOS static random access memory device with bit line bias control. 4,961,168, Cl. 365-189.110.
Tratnyek, Joseph P.: *See*—
Connor, Margaret B.; and Tratnyek, Joseph P., 4,960,531, Cl. 252-70.000.
Travis, Karen L.: *See*—
Harvey, Michael A.; Manning, Brenda D.; Nicholson, Mary L.; Travis, Karen L.; and Luderer, Albert A., 4,960,716, Cl. 436-542.000.
Trecker, Gary W.; and Monckton, Susan P., to Kraft, Inc. Grated hard Parmesan cheese and method for making same. 4,960,605, Cl. 426-582.000.
Trenkle, Robert W.: *See*—
Wilson, Richard A.; Zampino, Michael J.; Mookherjee, Braja D.; Trenkle, Robert W.; Van Ouwerkerk, Anton; Hagedorn, Myrna L.; and Monteleone, Michael G., 4,960,754, Cl. 512-25.000.

Tribert, Claude, to Howden Food Equipment, Inc. Method and apparatus for topping off containers with liquid to predetermined headspace level. 4,960,156, Cl. 141-1.000.

Tripp, Susan J.: *See*—
Chandramouli, Bopsi; Eppling, Gary L.; and Tripp, Susan J., 4,961,186, Cl. 370-79.000.

Trischuk, Ronald W.: *See*—
Pellow, Scott W.; Trischuk, Ronald W.; Knapp, Christopher E.; and Bauer, Ralph, 4,960,441, Cl. 51-293.000.

Trivellato, Stefano: *See*—
della Porta, Paolo; Martelli, Daniele; Urso, Giuseppe; and Trivellato, Stefano, 4,961,040, Cl. 313-561.000.

Troup, Sue, to Hughes Aircraft Company. Plating on metallic substrates. 4,960,493, Cl. 204-32.100.

Trudell, Gerald R.; and Marlinga, Terrance C., to AP Parts Manufacturing Company. Precision bending apparatus. 4,959,984, Cl. 72-20.000.

Tsang, Paul J.: *See*—
Silvestri, Victor J.; and Tsang, Paul J., 4,960,717, Cl. 437-33.000.

Tsaprazis, Edward, to Aeroquip Corporation. Dual optical level monitor. 4,961,069, Cl. 340-619.000.

Tsubaki, Nobuyuki; and Nakano, Yoshio, to Nippon Oil and Fats Co., Ltd. Triglycerides having stability with lapse of time and method for stabilization thereof. 4,960,794, Cl. 514-547.000.

Tsubata, Yukihiro; and Shiino, Masaru, to Fuji Photo Film Co., Ltd. Process of stalling the speeds of articles to be conveyed in a pneumatic conveying system and a device therefor. 4,960,350, Cl. 406-84.000.

Tsuboi, Shinichi: *See*—
Shiokawa, Kozo; Tsuboi, Shinichi; Sasaki, Shoko; Moriya, Koichi; Hattori, Yumi; and Shibuya, Katsuhiko, 4,960,780, Cl. 514-300.000.

Tsuboi, Takao: *See*—
Hanaoka, Kazuo; Chabata, Sueji; Koike, Michio; and Tsuboi, Takao, 4,960,641, Cl. 428-383.000.

Tsubota, Kazuaki: *See*—
Yasuda, Yoshikazu; Tsubota, Kazuaki; and Tanimoto, Shiro, 4,960,479, Cl. 156-251.000.

Tsuchiya, Shigeru: *See*—
Toida, Shouji; Iwasaki, Kazunori; Goto, Toru; and Tsuchiya, Shigeru, 4,960,218, Cl. 215-311.000.

Tsugane, Shuzo; and Yasuda, Tooru, to NEC Corporation. Television conference system including many television monitors and method for controlling the same. 4,961,211, Cl. 379-54.000.

Tsukaya, Takashi: *See*—
Kubokawa, Hiroaki; Tsukaya, Takashi; Ueda, Yasuhiro; Nakamura, Takeaki; Ohshima, Yutaka; Hibino, Hiroki; Takayama, Shyuichi; and Hagino, Tadao, 4,960,106, Cl. 128-6.000.

Tsuo, Y. Simon; and Deb, Satyen K., to Midwest Research Institute. Hydrogen ion microlithography. 4,960,675, Cl. 430-311.000.

Tsuri, Tatsuo: *See*—
Narisada, Masayuki; Ohtani, Mitsuaki; Watanabe, Fumihiko; Hagishita, Sanji; Seno, Kaoru; Kamata, Susumu; Haga, Nobuhiro; Tsuri, Tatsuo; Tsushima, Tadahiko; and Kawada, Kenji, 4,960,909, Cl. 549-463.000.

Tsushima, Tadahiko: *See*—
Narisada, Masayuki; Ohtani, Mitsuaki; Watanabe, Fumihiko; Hagishita, Sanji; Seno, Kaoru; Kamata, Susumu; Haga, Nobuhiro; Tsuri, Tatsuo; Tsushima, Tadahiko; and Kawada, Kenji, 4,960,909, Cl. 549-463.000.

Tsutsumi, Katsuji. Washing machine. 4,959,930, Cl. 51-426.000.

Tudor, Ernest C., to California Steel Industries, Inc. Sheet steel package assembly. 4,960,209, Cl. 206-597.000.

Tunoda, Mituaki; and Suzuki, Nobuharu, to Nippon Kayaku Kabushiki Kaisha. Crystalline form of acetamido-amino-nitro-azo-benzene dye and a process for preparing the same. 4,960,435, Cl. 8-526.000.

Turanchik, Michael F.: *See*—
Lentrichia, Brian B.; and Turanchik, Michael F., 4,960,692, Cl. 435-7.000.

Turf Drain Company of America, Inc.: *See*—
Hurley, Dennis; Anderson, Roy; and Gorzycki, Ken, 4,960,345, Cl. 405-38.000.

Tyan, Yuan-Sheng: *See*—
Pan, Kee-Chuan; Tyan, Yuan-Sheng; and Preuss, Donald R., 4,960,680, Cl. 430-346.000.

Tykal, James C.: *See*—
Maher, John W.; Mulford, Keith I.; and Tykal, James C., 4,961,070, Cl. 340-721.000.

U.R. Engineering Pty. Ltd.: *See*—
Burke, Desmond C., 4,959,950, Cl. 56-340.100.

Uchida, Masafumi: *See*—
Yamada, Hiroyuki; Takagiwa, Hiroyuki; Masaki, Hiroya; Kasuya, Takahira; Takahashi, Jiro; Uchida, Masafumi; and Ikeuchi, Satoru, 4,960,664, Cl. 430-109.000.

Uchida, Yasumi: *See*—
Tanabe, Sohei; Sato, Seiichi; Kyotani, Yoshinori; Ohta, Tomio; and Uchida, Yasumi, 4,960,883, Cl. 540-575.000.

Uchihori, Ikuo, to Kabushiki Kaisha Toshiba. Translation lookaside buffer control system. 4,961,135, Cl. 364-200.000.

Udell, Theodore H., to Container Corporation of America. Apparatus for making a plastic container with integral handling ring. 4,960,376, Cl. 425-525.000.

Ueda, Hiroshi: *See*—
Eonomoto, Takamitsu; Ueda, Hiroshi; Kawahara, Midori; Okada, Naoki; and Murata, Noboru, 4,960,551, Cl. 264-65.000.

Ueda, Kouichi: *See*—
Katayama, Eiichi; Ueda, Kouichi; Takebayashi, Hiroaki; and Rokkaku, Kazuo, 4,960,405, Cl. 475-183.000.

Ueda, Masaaki: *See*—
Matsuda, Shunsuke; Hioki, Yasuhiro; and Ueda, Masaaki, 4,961,178, Cl. 369-103.000.

Ueda, Takaharu; Yamamoto, Tetsu; Ogura, Manabu; and Yumura, Takashi, to Mitsubishi Denki Kabushiki Kaisha. Document scanner driven by electromagnetic actuators. 4,961,118, Cl. 358-497.000.

Ueda, Yasuhiro: *See*—
Kubokawa, Hiroaki; Tsukaya, Takashi; Ueda, Yasuhiro; Nakamura, Takeaki; Ohshima, Yutaka; Hibino, Hiroki; Takayama, Shyuichi; and Hagino, Tadao, 4,960,106, Cl. 128-6.000.

Ueda, Youichi: *See*—
Saito, Yasuhisa; Kamio, Kunimasa; Shibata, Mitsuhiro; Watanabe, Katsuya; Shiomi, Yutaka; and Ueda, Youichi, 4,960,860, Cl. 528-353.000.

Uehara, Izushi, to NEC Corporation. System for processing communications among central processing units. 4,961,132, Cl. 364-200.000.

Uehara, Kensuke, to Kabushiki Kaisha Toshiba. Method and apparatus for inputting a voice through a microphone. 4,961,177, Cl. 367-197.000.

Ueno, Hiroshi: *See*—
Murata, Masahide; Imai, Masafumi; Furuhashi, Hiroyuki; Maruyama, Kouji; and Ueno, Hiroshi, 4,960,743, Cl. 502-121.000.

Ueno, Keiji, to Sumitomo Electric Industries, Ltd. Fluoroelastomer composition and heat shrinkable articles comprising same. 4,960,624, Cl. 428-35.100.

Uerdingen, Walter: *See*—
Kloker, Werner; Freitag, Dieter; Uerdingen, Walter; Hess, Bernhard; and Schmid, Helmut, 4,961,179, Cl. 369-288.000.

Ukena, Toshiyasu: *See*—
Yamada, Teruaki; Akisue, Osamu; Ukena, Toshiyasu; Oda, Masahiko; and Hayashida, Teruki, 4,960,158, Cl. 148-156.000.

Umeda, Yoshihito: *See*—
Komatsuzaki, Hiroshi; Kamata, Kazuo; Ohmiya, Akio; Nishimura, Syunji; Umeda, Yoshihito; Mochizuki, Noriya; and Furuya, Eiji, 4,961,084, Cl. 354-268.000.

Umemoto, Donald K.: *See*—
Holm-Kennedy, James W.; and Umemoto, Donald K., 4,960,177, Cl. 177-210.00C.

Union Carbide Chemicals and Plastics Company Inc.: *See*—
Foster, George N.; Petty, Herbert E.; and Blevins, Charles H., II., 4,960,810, Cl. 524-265.000.
Gerkin, Richard M.; and Kirchner, David L., 4,960,942, Cl. 564-479.000.

Union Carbide Coatings Service Technology Corp.: *See*—
Hatch, Russell B., 4,960,050, Cl. 101-348.000.

Union Carbide Corporation: *See*—
Campbell, Michael J., 4,960,579, Cl. 423-351.000.

Uniroyal Chemical Company, Inc.: *See*—
Allen, Ralph D.; Thiruvengada, Seshan; Cesare, Frank C.; and Visser, Harry D., 4,960,829, Cl. 525-193.000.

United States of America
Agriculture: *See*—
Dalby, Glenn R.; and Heiland, Wolfgang K., 4,960,525, Cl. 210-788.000.
Air Force: *See*—
Arnold, Fred E.; and Burkett, Jerry L., 4,960,853, Cl. 528-183.000.
Arnold, Fred E.; and Burkett, Jerry L., 4,960,854, Cl. 528-183.000.
Arnold, Fred E.; and Burkett, Jerry L., 4,960,858, Cl. 528-337.000.
Arnold, Fred E.; and Burkett, Jerry L., 4,960,859, Cl. 528-342.000.
Army: *See*—
Hoke, Steven H., 4,960,496, Cl. 204-153.130.
Lavan, Michael J.; Edlin, George R.; and Whitener, Daniel L., 4,960,990, Cl. 250-251.000.
Peck, Carl C., 4,960,467, Cl. 106-209.000.
Energy: *See*—
Duncan, David B.; and Alger, Terry W., 4,961,199, Cl. 372-56.000.
Pillsbury, Paul W., 4,960,056, Cl. 110-233.000.
Navy: *See*—
Banura, George A., 4,961,048, Cl. 323-351.000.
Blue, Joseph E.; and Watson, Thomas C., 4,961,175, Cl. 367-142.000.
Elliott, Myron A., 4,961,181, Cl. 367-142.000.
Fatemi, Mohammad, 4,961,210, Cl. 378-73.000.
Pazik, John C., 4,960,916, Cl. 556-70.000.
Reilly, John J.; and Kamel, Ihab L., 4,960,818, Cl. 524-440.000.
Spadafora, Stephen J., 4,960,817, Cl. 524-440.000.
Sutula, Raymond A.; and Wang, Frederick E., 4,960,564, Cl. 420-400.000.
Teel, Willis A.; and Christoff, James T., 4,961,174, Cl. 367-97.000.

U.S. Philips Corporation: *See*—
Augusteijn, Alexander; and Hopmans, Fransiscus P. M., 4,961,137, Cl. 364-200.000.
De Jager, Willem, 4,961,046, Cl. 323-315.000.
Hellings, Gerardus J. A.; Van Der Heijden, Antonius W. F.; Himmelbauer, Erich E.; Vrijssen, Gerardus A. H. M.; Spanjer, Tjerk G.; Van Alphen, Willem M.; and Van Engelshoven, Jeroen, 4,961,022, Cl. 313-414.000.

Hermes, Dirk J., 4,961,228, Cl. 381-41.000.
Linhart, Claud H., 4,961,213, Cl. 378-181.000.
Schofield, John M. S., 4,960,329, Cl. 356-5.000.
Schwarz, Dieter; and Kauschke, Hans-Dieter, 4,961,180, Cl. 370-110.100.
Van Endschot, Johannes G.; and Van Der Vegt, Adrianus A. J., 4,961,214, Cl. 378-197.000.
Vrijssen, Gerardus A. H. M.; and Van Rijswijk, Ronald, 4,961,023, Cl. 313-456.000.

United Technologies Corporation: *See*—
Jarmon, David C.; and Prewo, Karl M., 4,960,629, Cl. 428-113.000.
Malinoski, David A.; and Conde, Robert V., 4,960,451, Cl. 65-3.200.
Patterson, Gregory S.; and Kelly, James B., 4,959,955, Cl. 60-204.000.

Unitika Ltd.: *See*—
Imahori, Kazutomo; Kondo, Hitoshi; Nakajima, Hiroshi; and Iwasaki, Tatsuo, 4,960,696, Cl. 435-42.000.

Universal Medical Instrument Corp.: *See*—
Fink, E. David, 4,960,412, Cl. 604-167.000.

Universal Porosics, Inc.: *See*—
Zievers, Elizabeth C., 4,960,448, Cl. 55-523.000.

University of Alberta, The Governors of the: *See*—
Arnold, Lee D.; and Vederas, John C., 4,960,832, Cl. 525-328.800.

University of Hawaii: *See*—
Holm-Kennedy, James W.; and Umemoto, Donald K., 4,960,177, Cl. 177-210.00C.

University of Kansas: *See*—
Stella, Valentino J.; and Mathew, Abraham E., 4,960,790, Cl. 514-449.000.

University of Manitoba: *See*—
McLeod, Robert; Card, Howard; Hortensius, Peter; and Pries, Werner, 4,961,159, Cl. 364-717.000.

University of Minnesota, The Regents of the: *See*—
Semmens, Michael J., 4,960,520, Cl. 210-640.000.

University of Pennsylvania, Trustees of the: *See*—
dePaola, Robert; and Ostlund, Stellan, 4,960,129, Cl. 128-695.000.

University of Rochester, The: *See*—
Skupsky, Stanley; Craxton, Stephen; and Soures, John, 4,961,195, Cl. 372-31.000.

Uno, Tomoko: *See*—
Kasuga, Toshihiro; Yoshida, Masahiro; Uno, Tomoko; and Nakajima, Kiichi, 4,960,733, Cl. 501-10.000.

UOP: *See*—
Haun, Edward C.; Milner, Steven S.; and Lomas, David A., 4,960,503, Cl. 208-85.000.
House, David W.; and Scott, Ray V., Jr., 4,960,620, Cl. 427-385.500.
Pellet, Regis J.; Rabo, Jule A.; Long, Gary N.; Gortsema, Frank P.; and Springer, Albert R., 4,960,504, Cl. 208-411.000.

Urano, Joji: *See*—
Sugimori, Yoshio; Araki, Yousai; and Urano, Joji, 4,961,112, Cl. 358-141.000.

Urquhart, Andrew W.: *See*—
Luzzsz, Stanley J.; and Urquhart, Andrew W., 4,960,736, Cl. 501-127.000.

Urso, Charles L. Versatile heater/cooler. 4,960,103, Cl. 126-204.000.

Urso, Giuseppe: *See*—
della Porta, Paolo; Martelli, Daniele; Urso, Giuseppe; and Trivellato, Stefano, 4,961,040, Cl. 313-561.000.

Ushler, Richard P. Conical twist-lock electrical connector. 4,960,395, Cl. 439-864.000.

Utsumi, Shigeo: *See*—
Tomitaka, Kichinojo; Utsumi, Shigeo; and Koizumi, Masumi, 4,960,636, Cl. 428-220.000.

Uyeo, Shoichiro, to Shionogi & Co., Ltd. Process for carbapenem intermediates. 4,960,879, Cl. 540-200.000.

Uyeo, Shoichiro, to Shionogi & Co., Ltd. Alkenylsilylazetidinone intermediates for carbapenems. 4,960,880, Cl. 540-200.000.

Vac-Puff Corporation: *See*—
Johannes, Wayne N., 4,960,206, Cl. 206-459.000.

Valeo Systemes d'Essuyage: *See*—
Eustache, Jean-Pierre, 4,959,883, Cl. 15-250.350.

Valiant, Mary E.: *See*—
Currie, Sara A.; Miller, Thomas W.; Dulaney, Eugene L.; Springer, James P.; Valiant, Mary E.; del Val, Sagrario M.; and Zimmerman, Sheldon B., 4,960,698, Cl. 435-119.000.

Vallet, Jean C.: *See*—
de Givry, Jacques; Vallet, Jean C.; and Lalfer, Jean P., 4,959,900, Cl. 29-840.000.

Valley Tissue Packaging, Inc.: *See*—
Rooyakkers, Michael L.; and Harvey, Ken E., 4,959,945, Cl. 53-378.000.

Van Alphen, Willem M.: *See*—
Hellings, Gerardus J. A.; Van Der Heijden, Antonius W. F.; Himmelbauer, Erich E.; Vrijssen, Gerardus A. H. M.; Spanjer, Tjerk G.; Van Alphen, Willem M.; and Van Engelshoven, Jeroen, 4,961,022, Cl. 313-414.000.

Vandenbossche, Jean J.: *See*—
Junino, Alex; Vandenbossche, Jean J.; Borowiak, Herve; and Lang, Gerard, 4,960,432, Cl. 8-411.000.

VandenBrossche, Daniel J.: *See*—
Holda, Steven F.; Plonka, Francis E.; VandenBrossche, Daniel J.; and Felice, John S., 4,961,148, Cl. 364-468.000.

Vanderbilt, Jeffrey J.: *See*—
Devon, Thomas J.; Phillips, Gerald W.; Puckette, Thomas A.; Stavinoha, Jerome L.; and Vanderbilt, Jeffrey J., 4,960,949, Cl. 568-454.000.

Van Der Heijden, Antonius W. F.: *See*—
Hellings, Gerardus J. A.; Van Der Heijden, Antonius W. F.; Himmelbauer, Erich E.; Vrijssen, Gerardus A. H. M.; Spanjer, Tjerk G.; Van Alphen, Willem M.; and Van Engelshoven, Jeroen, 4,961,022, Cl. 313-414.000.

van der Meer, Roelof, to General Electric Company. Polymer mixture comprising polyphenylene ether and polyamide. 4,960,825, Cl. 525-92.000.

Van Der Vegt, Adrianus A. J.: *See*—
Van Endschot, Johannes G.; and Van Der Vegt, Adrianus A. J., 4,961,214, Cl. 378-197.000.

Van Doorn, Johannes A.; Wife, Richard L.; and Budzelaar, Petrus H. M., to Shell Oil Company. Catalyst composition containing diphosphines having heterocyclic substituents. 4,960,747, Cl. 502-167.000.

Van Endschot, Johannes G.; and Van Der Vegt, Adrianus A. J., to U.S. Philips Corporation. X-ray examination apparatus comprising a balanced supporting arm. 4,961,214, Cl. 378-197.000.

Van Engelshoven, Jeroen: *See*—
Hellings, Gerardus J. A.; Van Der Heijden, Antonius W. F.; Himmelbauer, Erich E.; Vrijssen, Gerardus A. H. M.; Spanjer, Tjerk G.; Van Alphen, Willem M.; and Van Engelshoven, Jeroen, 4,961,022, Cl. 313-414.000.

van Lengerich, Bernhard H., to Nabisco Brands, Inc. Extruder and continuous mixer arrangement for producing an at least partially baked product having a cookie-like crumb structure. 4,960,043, Cl. 99-353.000.

Van Ouwerkerk, Anton: *See*—
Wilson, Richard A.; Zampino, Michael J.; Mookherjee, Braja D.; Trenkle, Robert W.; Van Ouwerkerk, Anton; Hagedorn, Myrna L.; and Monteleone, Michael G., 4,960,754, Cl. 512-25.000.

Van Putte, Karel P.; and Muller, Johannes J., to Lever Brothers Company. Fractionation of fat blends. 4,960,544, Cl. 260-420.000.

Van Rijswijk, Ronald: *See*—
Vrijssen, Gerardus A. H. M.; and Van Rijswijk, Ronald, 4,961,023, Cl. 313-456.000.

Vaughan, David E. W.; and Strohmaier, Karl G., to Exxon Research and Engineering Company. Zeolite ECR-10. 4,960,578, Cl. 423-326.000.

VDO Adolf Schindling AG: *See*—
Aufmkolk, Rudolf, 4,960,091, Cl. 123-399.000.
Muschalik, Gerald; and Hahn, Winfried, 4,960,090, Cl. 123-399.000.

Veb Greika Greiz Weberei und Veredlung: *See*—
Koerber, Heinz; Hanke, Rudolf; Paessler, Helmar; Kessler, Bernd; Raetzsch, Manfred; Heger, Adolf; and Kolletzky, Karlheinz, 4,960,430, Cl. 8-114.000.

Vedage, Gamini A.; Henderson, William W.; Toseland, Bernard A.; and Deeba, Michel, to Air Products and Chemicals, Inc. Hydrogenation of aromatic amines to produce their ring hydrogenated counterparts. 4,960,941, Cl. 564-450.000.

Vederas, John C.: *See*—
Arnold, Lee D.; and Vederas, John C., 4,960,832, Cl. 525-328.800.

Vedres, Andras; Szantay, Csaba; Stefko, Bela; Kreidl, Janos; Nemes, Andras; Blasko, Gabor; Bogsch, Erik; Mathe, Denes; Hegedus, Istvan; Szuchovszky, Adrien, nee Gergely; and Mester, Tamas, to Richter Gedeon Vegyeszeti Gyar R.T. Preparation of 6-amino-1,2-dihydro-1-hydroxy-2-imino-4-piperidinopyrimidine compounds. 4,960,888, Cl. 544-323.000.

Vemmer, Helmut, to Peter Lancier Maschinebau-Hafenhutte Gmbh & Co. KG. Traction dynamometer for measuring tensile forces in the laying of cables. 4,960,001, Cl. 73-862.670.

Veneziani, Carlo: *See*—
Carenzi, Angelo; Chiarino, Dario; Della Bella, Davide; Grancini, Gian Carlo; and Veneziani, Carlo, 4,960,788, Cl. 514-424.000.

Venture Innovations, Inc.: *See*—
House, Roy F.; Granquist, Victor M.; and Cowan, Jack C., 4,960,740, Cl. 501-148.000.

Verdier, Claude; Leporcq, Bruno; Georges, Eric; and Barraud, Roger, to Office National d'Etudes et de Recherche Aerospatiales. Process and generator for generating atomic iodine in the fundamental state, and iodine chemical laser employing such. 4,961,200, Cl. 372-89.000.

Vertikum Magas-es Melyepitmenyjavito Kiszovetkezet: *See*—
Foldi, Tivadar; Bernat, Istvan; and Vogronics, Laszlo, 4,960,332, Cl. 356-376.000.

Vestal, Marvin L.; Blakely, Calvin R.; and Fergusson, Gordon J., to Research Corporation Technologies. Method and means for vaporizing liquids by means of heating a sample capillary tube for detection or analysis. 4,960,992, Cl. 250-288.000.

Vetco Gray Inc.: *See*—
Nelson, John E., 4,960,172, Cl. 166-208.000.

Vickers, Incorporated: *See*—
Habib, Joseph; Nielsen, Paul; and Nielsen, Paul H., 4,961,055, Cl. 324-662.000.

Victor Company of Japan, Ltd.: *See*—
Kuwaoka, Toshiharu, 4,961,205, Cl. 375-36.000.

Victorian Solar Energy Council: *See*—
Koplick, Andrew J., 4,960,466, Cl. 106-1.290.

Vidal, Pierre: *See*—
Vigneron, Gilbert; Bezier, Jean; Nguyen-Thanh, Thong; Vidal, Pierre; Zacharie, Guy; and Guillemin, Lucien, 4,960,650, Cl. 428-594.000.

Viegas, Herman H.: *See*—
Havemann, Robert K.; Viegas, Herman H.; and DeGrego, Ricardo S., 4,960,088, Cl. 123-198.00D.

Vieux, Gerard; Boisson, Daniel; de Groot, Paul; and Colomb, Gilbert-Rene , to Thomson-CSF. Manufacturing process of a photocathode for an image intensifier tube. 4,960,608, Cl. 427-10.000.

Vigneron, Gilbert; Bezier, Jean; Nguyen-Thanh, Thong; Vidal, Pierre; Zacharie, Guy; and Guillemin, Lucien, to Societe Anonyme; and Electricite De France. Method of repairing or protecting an end of a metal tube in a heat exchanger and sleeve for implementing same. 4,960,650, Cl. 428-594.000.

Villa, Stefano: *See*—
Canosi, Umberto; De Fazio, Gabriele; and Villa, Stefano, 4,960,868, Cl. 530-389.000.

Visser, Harry D.: *See*—
Allen, Ralph D.; Thiruvengada, Seshan; Cesare, Frank C.; and Visser, Harry D., 4,960,829, Cl. 525-193.000.

VISystems, Inc.: *See*—
Lackie, C. Willard; and Talati, Kiritkumar, 4,961,133, Cl. 364-200.000.

Vlasov, Arkady P.: *See*—
Alexandrov, Maxim L.; Belenky, Boris G.; Gotlib, Vladimir A.; Vlasov, Arkady P.; Komarov, Nikolai N.; Sudiiin, Valery V.; and Shevkunov, Vsevolod V., 4,960,516, Cl. 210-198.200.

Vock, Manfred H.: *See*—
Farbood, Mohamad I.; Morris, James A.; Sprecker, Mark A.; Bienkowski, Lynda J.; Miller, Kevin P.; Vock, Manfred H.; and Hagedorn, Myrna L., 4,960,597, Cl. 426-3.000.

Voest-Alpine Aktiengesellschaft: *See*—
Freimann, Paul; and Staudinger, Gernot, 4,960,439, Cl. 48-62.00R.

Voest-Alpine Automotive Gesellschaft m.b.H.: *See*—
Kronberger, Maximilian; and Drummer, Eugen, 4,960,241, Cl. 239-90.000.

Voest-Alpine Industrieanlagenbau Gesellschaft mbH: *See*—
Eidinger, Helmut; and Scheurecker, Werner, 4,960,165, Cl. 164-491.000.
Rametsteiner, Hermann; Schwaha, Karl; Hirschmanner, Franz; and Bramerdorfer, Heinz, 4,960,164, Cl. 164-480.000.

Vogronics, Laszlo: *See*—
Foldi, Tivadar; Bernat, Istvan; and Vogronics, Laszlo, 4,960,332, Cl. 356-376.000.

Vorbrueggen, Helmut; and Krolikiewicz, Konrad, to Schering Aktiengesellschaft. Process for the production of bicyclo(3.3.0)octane-3,7-dione-2-carboxylic acid esters. 4,960,907, Cl. 549-336.000.

Vrijssen, Gerardus A. H. M.; and Van Rijswijk, Ronald, to U.S. Philips Corporation. Cathode ray tube including a helical focusing lens. 4,961,023, Cl. 313-456.000.

Vrijssen, Gerardus A. H. M.: *See*—
Hellings, Gerardus J. A.; Van Der Heijden, Antonius W. F.; Himmelbauer, Erich E.; Vrijssen, Gerardus A. H. M.; Spanjer, Tjerk G.; Van Alphen, Willem M.; and Van Engelshoven, Jeroen, 4,961,022, Cl. 313-414.000.

W. R. Grace & Co.: *See*—
Arfaei, Ahmad, 4,960,465, Cl. 106-724.000.

Wada, Toshiya; Tanaka, Osamu; Egawa, Takatoshi; Yoshida, Makato; Higuchi, Seizun; and Izaki, Teruaki, to Nippon Steel Corporation. Grain-oriented electrical steel sheet having a low watt loss. 4,960,652, Cl. 428-611.000.

Wada, Yoshiyuki: *See*—
Kono, Michikata; Wada, Yoshiyuki; Kamihara, Tetuya; Tatematsu, Masahito; and Suda, Koichi, 4,960,089, Cl. 123-260.000.

Wade Manufacturing Co.: *See*—
Brown, Sidney L., 4,960,584, Cl. 423-658.500.

Wadhwa, Lachhman H.; and Steurer, Andrew M., to Hoechst Celanese Corporation. Internal lubricant for glass reinforced polyarylene sulfide. 4,960,813, Cl. 524-311.000.

WaferScale Integration, Inc.: *See*—
Shubat, Alexander; and Cedar, Yoram, 4,961,172, Cl. 365-230.060.

Wagner, Eckhard; and Eichler, Angelika, to Norddeutsche Schleifmittel-Industrie Christiansen & Co (GmbH & Co). Flexible grinding tool. 4,960,442, Cl. 51-295.000.

Wait, David S. Golf tool and carrier for golf items. 4,960,239, Cl. 273-32.00B.

Wakabayashi, Kenji: *See*—
Fujisawa, Atsuhisa; Ojima, Masuo; Wakabayashi, Kenji; Omoto, Souji; and Shimizu, Toyokazu, 4,960,611, Cl. 427-43.100.

Wakisaka, Kenichiro: *See*—
Yamaoki, Toshihiko; Wakisaka, Kenichiro; Minami, Kouji; and Iwamoto, Masayuki, 4,961,094, Cl. 355-326.000.

Wales, David: *See*—
Sagar, Brian; Hamlyn, Paul; and Wales, David, 4,960,413, Cl. 604-289.000.

Walisser, Wayne R., to Borden, Inc. Melamine-containing resole resitol and resite compositions. 4,960,826, Cl. 524-494.000.

Walker, Matthew: *See*—
Cozzini, Ivo; and Walker, Matthew, 4,960,599, Cl. 426-281.000.

Walker, Wendall C. Multi-action fishing lure. 4,959,920, Cl. 43-42.470.

Walsh, David A.; and Cale, Albert D., Jr., to A. H. Robins Company, Inc. 4-aryl-N-(alkylaminoalkyl, heterocyclicamino and heterocyclicamino)alkyl)-1-piperazinecarboxamides. 4,960,776, Cl. 514-252.000.

Walters, Patricia B.; and Allen, David C., to PPG Industries, Inc. Moisture seal for aircraft windows. 4,960,631, Cl. 428-192.000.

Walters, Peter C. Shopping cart bonnet. 4,960,302, Cl. 296-100.000.

Walther, Brian W.: *See*—
Lo, Grace Y.; Otterbacher, Eric W.; Bezoari, Massimo D.; and Walther, Brian W., 4,960,842, Cl. 526-175.000.

Waltonen, Edward J.: *See*—
Obrecht, Robert E.; and Waltonen, Edward J., 4,959,989, Cl. 72-450.000.

Wang, Bor-Jou. Structure of shaftless clip. 4,959,892, Cl. 24-510.000.

Wang, Bor-Jou. Multipurpose storage case. 4,960,205, Cl. 206-387.000.

Wang, David Nin-Kou: *See*—
Law, Kam S.; Leung, Cissy; Tang, Ching C.; Collins, Kenneth S.; Chang, Mei; Wong, Jerry Y. K.; and Wang, David Nin-Kou, 4,960,488, Cl. 156-643.000.

Wang, Frederick E.: *See*—
Sutula, Raymond A.; and Wang, Frederick E., 4,960,564, Cl. 420-400.000.

Wang, Taylor G.: *See*—
Kendall, James M., Jr.; Wang, Taylor G.; and Elleman, Daniel D., 4,960,351, Cl. 425-6.000.

Wang, Xingwu; and Royston, James D., to Greenwald, Howard J. Contactless mass transfer system. 4,960,760, Cl. 505-1.000.

Wankel, Felix H., deceased: *See*—
Obrist, Frank; Wankel, Felix H., deceased; Renz, Gerhard, executor; Meysen, Fried, executor; and Burkhardt, Thomas, executor, 4,960,370, Cl. 418-9.000.

Ward, Harold R., to Raytheon Company. Two and one-half dimensional radar system. 4,961,075, Cl. 342-140.000.

Ward, Robert W.: *See*—
Peng, Yuchi P.; Hallmann, Melvin H.; and Ward, Robert W., 4,961,016, Cl. 310-62.000.

Wargowski, David A.: *See*—
Burgess, Marvin J.; Wargowski, David A.; and Palka, Agnes M., 4,960,846, Cl. 528-26.000.

Warner-Lambert Company: *See*—
Butler, Donald E.; and Greenman, Barbara J., 4,960,931, Cl. 562-507.000.
Moos, Walter H., 4,960,815, Cl. 424-1.100.

Warren, Henry S., Jr.: *See*—
Hopkins, Martin E.; and Warren, Henry S., Jr., 4,961,141, Cl. 364-200.000.

Wartsila Meriteollisuus Oy: *See*—
Lappi, Erkki, 4,959,933, Cl. 52-79.700.

Wasley, Jan W. F., to Ciba-Geigy Corporation. Certain pyrrolyl-substituted hydroxamic acid derivatives. 4,960,787, Cl. 514-423.000.

Waste Management of North America, Inc.: *See*—
Worthington, Stanley W., 4,960,355, Cl. 414-408.000.

Watanabe, Fumihiko: *See*—
Narisada, Masayuki; Ohtani, Mitsuaki; Watanabe, Fumihiko; Hagishita, Sanji; Seno, Kaoru; Kamata, Susumu; Haga, Nobuhiro; Tsuri, Tatsuo; Tsushima, Tadahiko; and Kawada, Kenji, 4,960,909, Cl. 549-463.000.

Watanabe, Haruo: *See*—
Okabe, Kazuaki; Ishii, Hideyuki; Watanabe, Haruo; and Takeuchi, Shuichi, 4,960,849, Cl. 528-76.000.

Watanabe, Katsuya: *See*—
Saito, Yasuhisa; Kamio, Kunimasa; Shibata, Mitsuhiro; Watanabe, Katsuya; Shiomi, Yutaka; and Ueda, Youichi, 4,960,860, Cl. 528-353.000.

Watanabe, Kenichi: *See*—
Ogawa, Masazumi; Watanabe, Kenichi; and Yamazaki, Tsutomu, 4,959,897, Cl. 29-227.000.

Watanabe, Mitsuo; and Sawai, Toshihiko, to Hamamatsu Photonics Kabushiki Kaisha. Optical window and radiation position-sensitive detector using the same. 4,960,997, Cl. 250-368.000.

Watanabe, Seiichi: *See*—
Akao, Mutsuo; Watanabe, Seiichi; and Komatsu, Takuichi, 4,960,626, Cl. 428-36.920.

Watanabe, Shoichi; Takei, Takayuki; Hayashi, Terumine; and Natabe, Takashi, to Hitachi, Ltd.; and Hitachi Microcomputer Engineering Ltd. Method for deleting unused gates and method for manufacturing master-slice semiconductor integrated circuit device using the deleting method. 4,960,724, Cl. 437-51.000.

Watanabe, Shoji: *See*—
Baba, Kenji; Watanabe, Shoji; Yahagi, Hayao; and Ogasawara, Hitoshi, 4,960,512, Cl. 210-96.100.

Watanabe, Shunichi: *See*—
Ito, Noriki; Ogawara, Hiroshi; and Watanabe, Shunichi, 4,960,908, Cl. 549-403.000.

Watanabe, Tsuyoshi: *See*—
Kanamaru, Hitoshi; and Watanabe, Tsuyoshi, 4,961,116, Cl. 358-343.000.

Watanabe, Yoshiaki: *See*—
Tanaka, Sakae; and Watanabe, Yoshiaki, 4,960,719, Cl. 437-40.000.

Waters, Daniel F. Easel. 4,960,257, Cl. 248-442.200.

Watson, Teddie G.; and Orth, Jeffrey, to Comet Technologies, Inc. Fishing lure. 4,960,437, Cl. 43-42.310.

Watson, Thomas C.: *See*—
Blue, Joseph E.; and Watson, Thomas C., 4,961,175, Cl. 367-142.000.

Watson, William G.: *See*—
Ashok, Sankaranarayanan; and Watson, William G., 4,960,752, Cl. 505-1.000.

Wauer, Dieter: *See*—
Muller, Jurgen; Schmidt, Manfred; Wauer, Dieter; Zehetmaier, Thomas; Brys, Georges; Schoeters, Emile; Haug, Werner; and Bauer, Walter, 4,960,994, Cl. 250-327.200.

Wayne/Scott Fetzer Company: *See*—
Akhter, Pervez, 4,961,018, Cl. 310-87.000.
Weagley, Ronald J.; Fuller, Timothy J.; and Levy, Michael J., to Xerox Corporation. Toner and developer compositions with polysilylenes. 4,960,666, Cl. 430-109.000.
Webb, John L.: *See*—
Gray, Gerald A., Jr.; and Webb, John L., 4,961,090, Cl. 355-50.000.
Weber, Raimond: *See*—
Bruggendick, Hermann; Weber, Raimond; Richter, Ekkehard; and Knoppik, Berthold, 4,960,447, Cl. 55-390.000.
Weber, Robert N.: *See*—
Briggs, Robert C.; Weber, Robert N.; and Hoffer, John C., 4,960,317, Cl. 350-96.210.
Webster, Wilton W., Jr. Steerable catheter. 4,960,134, Cl. 128-786.000.
Wehowsky, Frank; Kleber, Rolf; and Jaeckel, Lothar, to Hoechst Aktiengesellschaft. Urethane made from aliphatic fluorinated alcohols, isocyanates and substituted aromatic compounds, a process for their preparation, and their use. 4,960,543, Cl. 560-26.000.
Weide, Joachim: *See*—
Dietz, Erwin; Hoffmann, Erich; and Weide, Joachim, 4,960,935, Cl. 564-325.000.
Weinbrecht, Michael, to ERSA Ernst Sachs KG GmbH & Co. Method and apparatus for operating a soldering station. 4,960,975, Cl. 219-241.000.
Weitzel, Wolfgang; and Egelhof, Dieter, to J.M. Voith GmbH. Common wire path of a wet end section of a twin wire paper making machine. 4,960,492, Cl. 162-301.000.
Wella Aktiengesellschaft: *See*—
Clausen, Thomas; and Rose, David, 4,960,955, Cl. 568-709.000.
Wells, John N.: *See*—
Maag, Gustav A.; and Wells, John N., 4,960,244, Cl. 239-424.000.
Wendler, John P., to Raytheon Company. Continually variable analog phase shifter. 4,961,062, Cl. 333-164.000.
Wenger Corporation: *See*—
Farrand, Philip F., 4,960,031, Cl. 84-609.000.
Werner, Kurt; Krieger, Leo G.; Bewley, Wilbur C.; and Tillman, Ennis L., to Whirlpool Corporation. Vacuum cleaner dirt receptacle. 4,960,446, Cl. 55-312.000.
Werth, John: *See*—
Early, Jack; and Werth, John, 4,961,151, Cl. 364-492.000.
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Goldenfield, Mark P.; and Lambert, David V., 4,960,984, Cl. 235-462.000.
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Yamada, Toshikazu; Kobori, Takuji; Sakamoto, Mitsuo; Maeda, Shozo; and Takahashi, Shinichi, to Kajima Corporation. Elasto-plastic damper for use in structure. 4,959,934, Cl. 52-167.00R.
Yamada, Toyokazu, to Idemitsu Petrochemical Company Limited. Laminated materials and laminated articles. 4,960,648, Cl. 428-476.300.
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Yamaya, Norimasa; Koga, Nobuhito; Ohta, Masahiro; and Yamaguchi, Akihiro, to Mitsui Toatsu Chemicals, Inc. Thermosetting resin compostion from bis, maleimide and bis (meta-amino phenoxy) compound. 4,960,852, Cl. 528-170.000.
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Yeh, Ching Fa; and Yatsuda, Yuji, 4,961,101, Cl. 357-49.000.
Yazawa, Masahiko; Kaneko, Hiroshi; and Takemoto, Katsuo, to Tosoh Corporation. Method of producing poly(vinyl chloride)-based resins. 4,960,843, Cl. 526-262.000.
Yeh, Ching Fa; and Yatsuda, Yuji, to Fuji Xerox Co., Ltd. Semiconductor MOSFET device with offset regions. 4,961,101, Cl. 357-49.000.
Yeh, Pochi A.: *See*—
Khoshnevisan, Mohsen; and Yeh, Pochi A., 4,960,322, Cl. 350-354.000.
Yen, Frank Y.; and Ardayfio, David D. Automotive transmission linkage system. 4,960,008, Cl. 74-473.00R.
Yntema, Everardus G. M., to Stork Friesland B. V. Apparatus for preparing a curd mass. 4,960,044, Cl. 99-458.000.
Yoda, Yukihiro: *See*—
Harada, Isao; Yoda, Yukihiro; Iwanaga, Naruyuki; Nishitsuji, Toshihiko; and Kikkawa, Akio, 4,960,581, Cl. 423-489.000.
Yodice, Richard, to Lubrizol Corporation, The. High surface area polymers of pyrrole or copolymers of pyrrole. 4,960,761, Cl. 502-159.000.
Yokohama Rubber Co., Ltd., The: *See*—
Hiza, Misao; Yamazaki, Hajime; Sugihara, Kazuhiro; and So, Tetsu; 4,960,633, Cl. 428-215.000.
Yokoi, Hiroshi, to Kanto Kasei Co., Ltd. Method of copper-nickel-cromium bright electroplating which provides excellent corrosion resistance and plating film obtained by the method. 4,960,653, Cl. 428-613.000.
Yokoi, Masaki: *See*—
Nishikawa, Masayuki; Komori, Yumiko; Yokoi, Masaki; Ono, Masato; Takahashi, Noriyoshi; Fukuda, Yuzuru; Yagi, Shigeru; and Karakida, Ken-ichi, 4,960,662, Cl. 430-64.000.
Yokoyama, Nobuyoshi; and Ejiri, Susumu, to Paloma Kogyo Kabushiki Kaisha. Pulse combustion device. 4,960,078, Cl. 122-24.000.
Yonetani, Mitsuo: *See*—
Kakino, Yoshiaki; Ihara, Yukitoshi; Yonetani, Mitsuo; and Teshima, Takeo, 4,961,034, Cl. 318-600.000.
Yoneyama, Kouichi: *See*—
Takematsu, Tetsuo; Yoneyama, Kouichi; Jikihara, Tetsuo; Katsurada, Manabu; Shike, Toyohiko; Hosokawa, Akemi; Mikami, Emiko; and Ikeda, Osamu, 4,960,897, Cl. 546-346.000.
Yonezawa, Akira, to Seiko Instruments, Inc. Scanning electron beam apparatus. 4,961,003, Cl. 250-398.000.
Yonushonis, Thomas M., to Cummins Engine Company, Inc. Ceramic particulate trap and method of making the same. 4,960,449, Cl. 55-523.000.
York, Melvin B. Folding table and seat assembly. 4,960,303, Cl. 297-159.000.
Yoshida, Hideyuki: *See*—
Yoshinaka, Minoru; Asakura, Eizo; Oku, Mitsumasa; Hamabe, Takeshi; Kitano, Motoi; and Yoshida, Hideyuki, 4,960,654, Cl. 428-614.000.
Yoshida, Hiroaki: *See*—
Terashima, Kazutaka; Kawachi, Masaru; and Yoshida, Hiroaki, 4,960,721, Cl. 437-247.000.
Yoshida, Kazuo: *See*—
Terauchi, Takashi; Yoshida, Kazuo; Machida, Yoshihisa; Okubo, Nobuyuki; and Konai, Yutaka, 4,960,945, Cl. 568-323.000.
Yoshida, Makato: *See*—
Wada, Toshiya; Tanaka, Osamu; Egawa, Takatoshi; Yoshida, Makato; Higuchi, Seizun; and Izaki, Teruaki, 4,960,652, Cl. 428-611.000.
Yoshida, Masahiro: *See*—
Kasuga, Toshihiro; Yoshida, Masahiro; Uno, Tomoko; and Nakajima, Kiichi, 4,960,733, Cl. 501-10.000.
Yoshimoto, Masahiko: *See*—
Matsumura, Tetsuya; and Yoshimoto, Masahiko, 4,961,169, Cl. 365-189.120.
Yoshinaka, Minoru; Asakura, Eizo; Oku, Mitsumasa; Hamabe, Takeshi; Kitano, Motoi; and Yoshida, Hideyuki, to Matsushita Electric Industrial Co., Ltd. Metal composition comprising zinc oxide whiskers. 4,960,654, Cl. 428-614.000.
Yoshino Kogyosho Co., Ltd.: *See*—
Iizuka, Shigeo; Kishi, Takao; Ogawa, Riichi; and Mizushima, Hiroshi, 4,960,339, Cl. 401-129.000.
Yoshino, Shigeo: *See*—
Saito, Yoshio; and Yoshino, Shigeo, 4,960,375, Cl. 425-131.100.
Yoshitomi Pharmaceutical Industries, Ltd.: *See*—
Moriwaki, Minoru; Abe, Masao; Mikashima, Hiroshi; and Tahara, Tetsuya, 4,960,770, Cl. 514-219.000.
Yoshitomi, Toshihiko; Yushina, Heihachi; Horiuchi, Hiromi; Yamaguchi, Yukio; Kamoshita, Yasuo; and Sekihara, Kiyoshi, to Mitsubishi Kasei Corporation. Magnetic toner for electrophotography. 4,960,668, Cl. 430-122.000.
Youlton, Henry G., to International Business Machines Corporation. Process for etching organic polymeric materials. 4,960,491, Cl. 156-668.000.
Youn, Han S.; Dong, Kim, Il; and Gyu, Choi I., to Sam Yang Co., Ltd. Polyester resin compound. 4,960,812, Cl. 524-291.000.
Young, Dewey R., II, to Exxon Production Research Company. Seismic source firing control system. 4,960,183, Cl. 181-107.000.
Young, Ilsa A.; and Roberts, Doris K. Carry-on travel bag for cosmetics. 4,960,204, Cl. 206-235.000.
Young, James T. Separator for liquids of different densities. 4,960,513, Cl. 210-104.000.
Young, Nicholas A.: *See*—
Maufe, Barry G.; and Young, Nicholas A., 4,961,203, Cl. 375-1.000.
Yu, David U. L. Relativistic klystron driven compact high gradient accelerator as an injector to an X-ray synchrotron radiation ring. 4,961,056, Cl. 328-235.000.
Yu, Zeng-gi: *See*—
Collins, George J.; McNeil, John R.; and Yu, Zeng-gi, 4,960,753, Cl. 505-1.000.

Yumura, Takashi: *See—*
Ueda, Takaharu; Yamamoto, Tetsu; Ogura, Manabu; and Yumura, Takashi, 4,961,118, Cl. 358-497.000.

Yung, Darby. Controlling access to network resources. 4,961,224, Cl. 380-25.000.

Yurecko, John, Jr.: *See—*
Eilerman, Robert; Christenson, Philip; Yurecko, John, Jr.; and Zebovitz, Thomas, 4,960,946, Cl. 568-376.000.

Yushina, Heihachi: *See—*
Yoshitomi, Toshihiko; Yushina, Heihachi; Horiuchi, Hiromi; Yamaguchi, Yukio; Kamoshita, Yasuo; and Sekihara, Kiyoshi, 4,960,668, Cl. 430-122.000.

Zacharie, Guy: *See—*
Vigneron, Gilbert; Bezier, Jean; Nguyen-Thanh, Thong; Vidal, Pierre; Zacharie, Guy; and Guillemin, Lucien, 4,960,650, Cl. 428-594.000.

Zambon Group S.p.A.: *See—*
Carenzi, Angelo; Chiarino, Dario; Della Bella, Davide; Grancini, Gian Carlo; and Veneziani, Carlo, 4,960,788, Cl. 514-424.000.

Zampino, Michael J.: *See—*
Wilson, Richard A.; Zampino, Michael J.; Mookherjee, Braja D.; Trenkle, Robert W.; Van Ouwerkerk, Anton; Hagedorn, Myrna L.; and Monteleone, Michael G., 4,960,754, Cl. 512-25.000.

Zarniko, Martin: *See—*
Sehr, Willibald; and Zarniko, Martin, 4,961,173, Cl. 367-96.000.

Zastko, Didier: *See—*
Grandjean, Daniel; Seurre, Jean-Michel; and Zastko, Didier, 4,961,060, Cl. 333-140.000.

Zaunberger, Franz-Xaver: *See—*
Reppert, Rudi; and Zaunberger, Franz-Xaver, 4,960,404, Cl. 475-23.000.

Zebovitz, Thomas: *See—*
Eilerman, Robert; Christenson, Philip; Yurecko, John, Jr.; and Zebovitz, Thomas, 4,960,946, Cl. 568-376.000.

Zeffren, Eugene: *See—*
Hoshowski, Myra A.; and Zeffren, Eugene, 4,960,588, Cl. 424-71.000.

Zehetmaier, Thomas: *See—*
Muller, Jurgen; Schmidt, Manfred; Wauer, Dieter; Zehetmaier, Thomas; Brys, Georges; Schoeters, Emile; Haug, Werner; and Bauer, Walter, 4,960,994, Cl. 250-327.200.

ZeiBig, Gerhard: *See—*
Neuman, Manfred; ZeiBig, Gerhard; Ihle, Karl-Heinz; Madler, Eckerhard; Schiller, Siegfried; and Schroller, Rudolf, 4,960,607, Cl. 427-8.000.

Zeller Corporation, The: *See—*
Mazziotti, Philip J., 4,960,334, Cl. 384-486.000.

Zenith Electronics Corporation: *See—*
Bloom, Gordon E., 4,961,128, Cl. 363-16.000.

Zerbes, Rudolf; Linke, Siegfried W.; Mohrmann, Karl H.; and Reiser, Wolf, to Bayer Aktiengesellschaft. Process for the preparation of oxiranes. 4,960,911, Cl. 549-519.000.

Zievers, Elizabeth C., to Universal Porosics, Inc. High temperature gas filter. 4,960,448, Cl. 55-523.000.

Zimmerman, Sheldon B.: *See—*
Currie, Sara A.; Miller, Thomas W.; Dulaney, Eugene L.; Springer, James P.; Valiant, Mary E.; del Val, Sagrario M.; and Zimmerman, Sheldon B., 4,960,698, Cl. 435-119.000.

Zinser Textilmaschinen GmbH: *See—*
Krawietz, Stefan, 4,959,953, Cl. 57-354.000.

Zofka, Stanislav: *See—*
Stoll, Kurt; Glaettli, Hans H.; and Zofka, Stanislav, 4,960,393, Cl. 439-651.000.

Zollers, Timothy E.: *See—*
Aiello, Salvatore F.; Brown, Jeffrey K.; Karasek, Donald F.; Lazzeroni, Edward J., Sr.; Lazzeroni, Edward J., Jr.; Quella, John F.; and Zollers, Timothy E., 4,959,923, Cl. 43-112.000.
Nelson, Kurt D.; Sus, Joseph E.; Lazzeroni, Edward J., Sr.; Zollers, Timothy E.; and Hanko, Jimmy J., 4,959,925, Cl. 43-125.000.

Zotter, Johann: *See—*
Stritzl, Karl; Hoffmann, Kurt; Freisinger, Henry; Janisch, Andreas; Brunnhuber, Egon; Zotter, Johann; Spitaler, Egelbert; Wladar, Helmut; Muhlberger, Reinhard; and Dapeci, Karl, 4,960,289, Cl. 280-630.000.

Zowtiak, John M.; and Mayall, Bruce I., to Baxter International Inc. Pressurized packaged reference liquid for blood gas analysis. 4,960,708, Cl. 436-11.000.

501 British Autogard Limited: *See—*
Fortune, David J.; and Wright, David E., 4,960,190, Cl. 192-56.00F.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 2ND DAY OF OCTOBER, 1990

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Abbott Laboratories: *See*—
Reynolds, Gordon S.; Todd, Robert J.; and Russell, Edward J., Re. 33,360, Cl. 128-675.000.

Armstrong World Industries, Inc.: *See*—
Barrall, Jeffery L., Re. 33,366, Cl. 501-84.000.

AT&T Bell Laboratories: *See*—
Darling, Donald W.; Dennis, Thomas M.; Thayer, Stevan J.; and Zimmer, Bonnie A., Re. 33,368, Cl. 375-8.000.

Barrall, Jeffery L., to Armstrong World Industries, Inc. Rigid, water-resistant phosphate ceramic materials and process for preparing them. Re. 33,366, Cl. 501-84.000.

Beaton, John M.; Huber, Joel E.; Padilla, Amphlett G.; and Breuer, Max E., to Upjohn Company, The. Non-aromatic oxygenated strong acid dehydration of 9α-hydroxyandrostenediones. Re. 33,364, Cl. 552-640.000.

Blyth, Randolph C.; and Ucci, Pompelio A., to Monsanto Company. Stain resistant nylon fibers. Re. 33,365, Cl. 428-97.000.

Breuer, Max E.: *See*—
Beaton, John M.; Huber, Joel E.; Padilla, Amphlett G.; and Breuer, Max E., Re. 33,364, Cl. 552-640.000.

Coe, Thomas U. Substrate and media carrier. Re. 33,361, Cl. 206-444.000.

Darling, Donald W.; Dennis, Thomas M.; Thayer, Stevan J.; and Zimmer, Bonnie A., to AT&T Bell Laboratories. Data set network diagnostic system. Re. 33,368, Cl. 375-8.000.

Dennis, Thomas M.: *See*—
Darling, Donald W.; Dennis, Thomas M.; Thayer, Stevan J.; and Zimmer, Bonnie A., Re. 33,368, Cl. 375-8.000.

Hashimoto Corporation: *See*—
Hashimoto, Kazuo, Re. 33,369, Cl. 379-104.000.

Hashimoto, Kazuo, to Hashimoto Corporation. Remote control device using telephone circuit of electric apparatus. Re. 33,369, Cl. 379-104.000.

Huber, Joel E.: *See*—
Beaton, John M.; Huber, Joel E.; Padilla, Amphlett G.; and Breuer, Max E., Re. 33,364, Cl. 552-640.000.

Lang, Thomas G. Planing catamaran vessel. Re. 33,359, Cl. 114-61.000.

Miller, Sidney H. Magnetic tracing apparatus. Re. 33,363, Cl. 434-409.000.

Minnesota Mining and Manufacturing Company: *See*—
Mongeon, Douglas R.; and Skwor, Edward P., Re. 33,362, Cl. 227-19.000.

Miura, Katsuhito; and Nakata, Tetsuya, to Osaka Soda Co., Ltd. Polyether polymer or copolymer, monomer therefor, and process for production thereof. Re. 33,367, Cl. 528-409.000.

Mongeon, Douglas R.; and Skwor, Edward P., to Minnesota Mining and Manufacturing Company. Bone stapler cartridge. Re. 33,362, Cl. 227-19.000.

Monsanto Company: *See*—
Blyth, Randolph C.; and Ucci, Pompelio A., Re. 33,365, Cl. 428-97.000.

Nakata, Tetsuya: *See*—
Miura, Katsuhito; and Nakata, Tetsuya, Re. 33,367, Cl. 528-409.000.

Osaka Soda Co., Ltd.: *See*—
Miura, Katsuhito; and Nakata, Tetsuya, Re. 33,367, Cl. 528-409.000.

Padilla, Amphlett G.: *See*—
Beaton, John M.; Huber, Joel E.; Padilla, Amphlett G.; and Breuer, Max E., Re. 33,364, Cl. 552-640.000.

Reynolds, Gordon S.; Todd, Robert J.; and Russell, Edward J., to Abbott Laboratories. Disposable transducer apparatus for an electromanometry system. Re. 33,360, Cl. 128-675.000.

Russell, Edward J.: *See*—
Reynolds, Gordon S.; Todd, Robert J.; and Russell, Edward J., Re. 33,360, Cl. 128-675.000.

Skwor, Edward P.: *See*—
Mongeon, Douglas R.; and Skwor, Edward P., Re. 33,362, Cl. 227-19.000.

Sukup, Eugene G. Drying bin floor. Re. 33,358, Cl. 52-263.000.

Thayer, Stevan J.: *See*—
Darling, Donald W.; Dennis, Thomas M.; Thayer, Stevan J.; and Zimmer, Bonnie A., Re. 33,368, Cl. 375-8.000.

Todd, Robert J.: *See*—
Reynolds, Gordon S.; Todd, Robert J.; and Russell, Edward J., Re. 33,360, Cl. 128-675.000.

Ucci, Pompelio A.: *See*—
Blyth, Randolph C.; and Ucci, Pompelio A., Re. 33,365, Cl. 428-97.000.

Upjohn Company, The: *See*—
Beaton, John M.; Huber, Joel E.; Padilla, Amphlett G.; and Breuer, Max E., Re. 33,364, Cl. 552-640.000.

Zimmer, Bonnie A.: *See*—
Darling, Donald W.; Dennis, Thomas M.; Thayer, Stevan J.; and Zimmer, Bonnie A., Re. 33,368, Cl. 375-8.000.

LIST OF REEXAMINATION PATENTEES

TO WHOM

CERTIFICATES WERE ISSUED

Acoustical Design Incorporated: *See*—
Goldstein, Harold, B1 4,024,535, Cl. 381-73.100.

Eichbauer, George N.; and LeBlanc, Beth A., to Mobil Oil Corporation. One-sided cling stretch wrap. B1 4,518,654, 10-2-90, Cl. 428-331.000.

Goldstein, Harold, to Acoustical Design Incorporated. Sound generating system for a sound masking package. B1 4,024,535, 10-2-90, Cl. 381-73.100.

Grieder, Traugott: *See*—
von Ballmoos, Fritz; Grieder, Traugott; Grohmann, Herbert; and Gutmann, Rolf, B1 3,845,351, Cl. 315-293.000.

Grohmann, Herbert: *See*—
von Ballmoos, Fritz; Grieder, Traugott; Grohmann, Herbert; and Gutmann, Rolf, B1 3,845,351, Cl. 315-293.000.

Gutmann, Rolf: *See*—
von Ballmoos, Fritz; Grieder, Traugott; Grohmann, Herbert; and Gutmann, Rolf, B1 3,845,351, Cl. 315-293.000.

LeBlanc, Beth A.: *See*—
Eichbauer, George N.; and LeBlanc, Beth A., B1 4,518,654, Cl. 428-331.000.

Macrovision: *See*—
Ryan, John O., B1 4,695,901, Cl. 380-5.000.

Mobil Oil Corporation: *See*—
Eichbauer, George N.; and LeBlanc, Beth A., B1 4,518,654, Cl. 428-331.000.

Ryan, John O., to Macrovision. Method and apparatus for removing pseudo-sync and/or a AGC pulses from a video signal. B1 4,695,901, 10-2-90, Cl. 380-5.000.

Varible-Parameter Fixture Dev. Corp.: *See*—
von Ballmoos, Fritz; Grieder, Traugott; Grohmann, Herbert; and Gutmann, Rolf, B1 3,845,351, Cl. 315-293.000.

von Ballmoos, Fritz; Grieder, Traugott; Grohmann, Herbert; and Gutmann, Rolf, to Varible-Parameter Fixture Dev. Corp. Method and apparatus for the adjustment of a plurality of floodlights. B1 3,845,351, 10-2-90, Cl. 315-293.000.

LIST OF DESIGN PATENTEES

Aaldenberg, Eric: *See*—
Hawes, Robert E., Jr.; and Aaldenberg, Eric, 311,024, Cl. D19-20.000.

Ackerly, Gary. Automobile wheel center cap. 310,991, 10-2-90, Cl. D12-213.000.

Advanced Recycling Systems Inc.: *See*—
Nordstrom, Michael D.; and Armstrong, Bob, 311,082, Cl. D34-24.000.

Ahola, Chester H. Holder for game chips. 311,035, 10-2-90, Cl. D21-54.000.

AirSep Corporation: *See*—
Vrana, Edward E.; and Bansal, Ravinder K., 311,061, Cl. D24-8.000.

Akiyama, Akio: *See*—
Wakayama, Shouji; and Akiyama, Akio, 311,013, Cl. D16-133.000.

Alie, Enrique; and Galli, Joseph, Jr., to Polaroid Corporation. Video camera or similar article. 311,015, 10-2-90, Cl. D16-202.000.

Ambasz, Emilio. Toothbrush and container set. 310,913, 10-2-90, Cl. D4-108.000.

Ambasz, Emilio. Combined toothbrush and container therefor. 310,914, 10-2-90, Cl. D4-108.000.

Ambasz, Emilio. Toothbrush and container set. 310,915, 10-2-90, Cl. D4-108.000.

Ambasz, Emilio. Combined toothbrush and container therefor. 310,916, 10-2-90, Cl. D4-108.000.

American Standard Inc.: *See*—
Stairs, Henry M., Jr., 311,057, Cl. D23-295.000.

Andersson, Karl E. P.: *See*—
Wilkinson, Andrew E.; and Andersson, Karl E. P., 310,974, Cl. D10-82.000.

Arduini, Giovanni; Bonfanti, Lorenzo; and Salvemini, Gianfranco, to Delta Elettronica s.p.a. Ultrasonic transmitting and receiving case for alarm systems. 310,975, 10-2-90, Cl. D10-106.000.

Armstrong, Bob: *See*—
Nordstrom, Michael D.; and Armstrong, Bob, 311,082, Cl. D34-24.000.

Arnott, John; Wilson, Donald H.; Kaga, Gary; and Somoza, Vincent, to Quantified Signal Imaging, Inc. Combined computer module and cart therefor. 311,080, 10-2-90, Cl. D34-21.000.

Asics Corporation: *See*—
Hase, Yoshiaki, 310,906, Cl. D2-314.000.

Astra Meditec Aktiebolag: *See*—
Utas-Sjoberg, Jan M. R., 311,064, Cl. D24-54.000.

Autowash Holdings, Inc.: *See*—
Badsey, William J., 310,982, Cl. D12-102.000.

Badsey, William J., to Autowash Holdings, Inc. Trailer. 310,982, 10-2-90, Cl. D12-102.000.

Bakic, Karena, to Cosmede Anstalt. Lipstick case. 311,073, 10-2-90, Cl. D28-85.000.

Bansal, Ravinder K.: *See*—
Vrana, Edward E.; and Bansal, Ravinder K., 311,061, Cl. D24-8.000.

Bass, Ginny; and Caldwell, Dean. Earring rack. 310,926, 10-2-90, Cl. D6-570.000.

Batchelor, Bruce L. Wheelbarrow tray extender. 311,084, 10-2-90, Cl. D34-27.000.

Bates Maufacturing Company, The: *See*—
Leszczak, John, 311,022, Cl. D18-15.000.

Bell & Howell Publication Systems Company: *See*—
Nuttall, Michael J.; and Lam, Lawrence, 310,999, Cl. D14-102.000.

Bellini, Mario, to Ing. C. Olivetti & C., S.p.A. Display. 311,000, 10-2-90, Cl. D14-113.000.

Bellini, Mario, to Ing. C. Olivetti & C., S.p.A. Portable electronic typewriter. 311,019, 10-2-90, Cl. D18-1.000.

Bellini, Mario, to Ing. C. Olivetti & C., S.p.A. Typewriter housing with cover. 311,020, 10-2-90, Cl. D18-1.000.

Bermack, Kiri. Combined card calender and container therefor. 311,025, 10-2-90, Cl. D19-21.000.

Biesecker, Frederick N., to Drug Plastics & Glass Company, Inc. Bottle set. 310,958, 10-2-90, Cl. D9-347.000.

Blake, Larry D., to Wasatch Fiber Group, Inc. Folding golf cart. 311,079, 10-2-90, Cl. D34-15.000.

Blau, Judith. Combined bedsheet and hand puppet pockets. 310,929, 10-2-90, Cl. D6-602.000.

Blevins, Gene, to Galaxy Machine Corporation. Body drier or warmer. 311,070, 10-2-90, Cl. D28-54.100.

Bonfanti, Lorenzo: *See*—
Arduini, Giovanni; Bonfanti, Lorenzo; and Salvemini, Gianfranco, 310,975, Cl. D10-106.000.

Bourbonniere, Alan: *See*—
Maxymych, Peter; Bourbonniere, Alan; Letendre, Michel; and Prijic, Nevenka, 310,910, Cl. D3-56.000.

Bradtl, Jo. Ski carrier. 310,909, 10-2-90, Cl. D3-36.000.

Brahma, Inc.: *See*—
Law, Don C.; and Gibbs, Richard, 310,987, Cl. D12-156.000.

Breger, Carl-Arne, to Holmens Bruk Aktiebolag. Towel dispenser. 310,923, 10-2-90, Cl. D6-522.000.

Breger, Carl-Arne, to Holmens Bruk Aktiebolag. Soap dispenser. 310,924, 10-2-90, Cl. D6-545.000.

Brivaplast S.r.l.: *See*—
Stefano, Vanoncini, 311,071, Cl. D28-77.000.

Brunel, Eveline. Toilet training chair for children. 311,058, 10-2-90, Cl. D23-296.000.

Brunton Company, The: *See*—
Iden, Marlin D., 310,970, Cl. D10-53.000.

Bubik, Leslie, to Vulcan Equipment Company. Towing vehicle body. 310,980, 10-2-90, Cl. D12-14.000.

Bulgari, Paolo, to Partecipazioni Bulgari S.p.A. Chain-like necklace. 310,978, 10-2-90, Cl. D11-3.000.

Butler, Anthony R., to Loctite Corporation. Container closure. 310,969, 10-2-90, Cl. D9-453.000.

Byrley, Frank D. Snack dispenser. 310,939, 10-2-90, Cl. D7-589.000.

Caldwell, Dean: *See*—
Bass, Ginny; and Caldwell, Dean, 310,926, Cl. D6-570.000.

Canon Kabushiki Kaisha: *See*—
Tanaka, Noboru; and Tsuboi, Takayuki, 311,016, Cl. D16-209.000.
Yoshida, Michio; and Kodaira, Takanori, 311,017, Cl. D16-209.000.

Capuano, Frank G., to Somerville Packaging Corporation. Ice cream carton. 310,965, 10-2-90, Cl. D9-416.000.

Carnielli, Teodoro. Exercise bicycle. 311,047, 10-2-90, Cl. D21-194.000.

Carson, Hennon. Ashtray. 311,068, 10-2-90, Cl. D27-106.000.

Carty, Walter F. Combined container and compartment for holding coolants. 310,941, 10-2-90, Cl. D7-605.000.

Chabria, Paul R., to Press-A-Lite Corporation. Pocket flashlight. 311,067, 10-2-90, Cl. D26-46.000.

Chandler, Maurice P., to General Motors Corporation. Vehicle wheel segment. 310,990, 10-2-90, Cl. D12-212.000.

Chubu Industries, Inc.: *See*—
Mitsubayashi, Yoshihiko, 310,932, Cl. D7-378.000.

Colclasure, George M., to Laid Back Enterprises, Inc. Novelty Santa Claus ball golf ball figure. 311,045, 10-2-90, Cl. D21-155.000.

Colgate-Palmolive Co.: *See*—
Segati, Umberto D. I., 310,963, Cl. D9-404.000.

Corder, James T. Bass drum and support therefor. 311,018, 10-2-90, Cl. D17-22.000.

Corley, John D. Valve for inflating tires, balloons, or the like. 311,055, 10-2-90, Cl. D23-233.000.

Cosmede Anstalt: *See*—
Bakic, Karena, 311,073, Cl. D28-85.000.

Covert, Darrell E.; Hammond, Philip S.; and Maxwell, Paul B., to Goodyear Tire & Rubber Company, The. Tire. 310,985, 10-2-90, Cl. D12-147.000.

Covert, Darrell E.; and Maxwell, Paul B., to Goodyear Tire & Rubber Company, The. Tire. 310,986, 10-2-90, Cl. D12-147.000.

Craft, Charles W., Jr.: *See*—
Mervar, Bob; Murphy, Kent W.; and Craft, Charles W., Jr., 310,925, Cl. D6-567.000.

Daido, Takefumi, to Sony Corporation. Earphone. 311,007, 10-2-90, Cl. D14-205.000.

Degree Baby Products: *See*—
Stephenson, Jim D., 311,063, Cl. D24-47.000.

Delepine, Jean-Claude. Elongated shower head with plural spray nozzles. 311,053, 10-2-90, Cl. D23-213.000.

Delepine, Jean-Claude. Elongated shower head with plural spray nozzles. 311,054, 10-2-90, Cl. D23-213.000.

Delta Elettronica s.p.a.: *See*—
Arduini, Giovanni; Bonfanti, Lorenzo; and Salvemini, Gianfranco, 310,975, Cl. D10-106.000.

Dennis, John B., to DVI. Saw blade caddy. 310,912, 10-2-90, Cl. D3-73.000.

DePoyster, Steven. Combined calendar and message board. 311,026, 10-2-90, Cl. D19-25.000.

Design Data, Inc.: *See*—
Speers, Samuel F., 310,966, Cl. D9-418.000.

Dinand, Pierre, to Parfums Loris Azzaro. Perfume bottle or similar article. 310,962, 10-2-90, Cl. D9-377.000.

Domestic Automation Company Inc.: *See*—
Edwards, Cree A.; and Johnson, Larsh M., 310,973, Cl. D10-75.000.

Dompier Equities Ltd.: *See*—
Maxymych, Peter; Bourbonniere, Alan; Letendre, Michel; and Prijic, Nevenka, 310,910, Cl. D3-56.000.

Drug Plastics & Glass Company, Inc.: *See*—
Biesecker, Frederick N., 310,958, Cl. D9-347.000.

Durand, Philippe J. Bowl or similar article. 310,937, 10-2-90, Cl. D7-564.000.

Durfee, John R.; and Trefz, Harlan J., to Noma Outdoor Products, Inc. Lawn mower body. 311,008, 10-2-90, Cl. D15-15.000.

Dutro, William A. Hand truck. 311,083, 10-2-90, Cl. D34-26.000.

DVI: *See*—
Dennis, John B., 310,912, Cl. D3-73.000.

Edwards, Cree A.; and Johnson, Larsh M., to Domestic Automation Company Inc. Device for use with utility meters to record time of energy use, demand and load profile data. 310,973, 10-2-90, Cl. D10-75.000.

Eichler, Susan D. Accessories hanger. 310,920, 10-2-90, Cl. D6-326.000.

Eldon Industries, Inc.: *See*—
Evenson, Mel, 311,028, Cl. D19-90.000.
Evenson, Mel; and Sharber, Jerry, 311,081, Cl. D34-23.000.

Ellerton, John R., to Stahmann Farms Incorporated. Nut sheller. 310,945, 10-2-90, Cl. D7-680.000.

Esselte Pendaflex Corporation: *See—*
Hawes, Robert E., Jr.; and Aaldenberg, Eric, 311,024, Cl. D19-20.000.
Evenson, Mel, to Eldon Industries, Inc. File assembly. 311,028, 10-2-90, Cl. D19-90.000.
Evenson, Mel; and Sharber, Jerry, to Eldon Industries, Inc. Office cart. 311,081, 10-2-90, Cl. D34-23.000.
Facom, S.A.: *See—*
Monnet, Rene P., 310,951, Cl. D8-52.000.
Fenne, Kenneth R., to Pittway Corporation. Flashlight. 311,066, 10-2-90, Cl. D26-46.000.
Finkelstein, Burl M., to Kason Industries, Inc. Door closer. 310,952, 10-2-90, Cl. D8-330.000.
Friedman, Harvey. Combined template-bookmark, and ruler. 310,971, 10-2-90, Cl. D10-62.000.
Fukuda, Kiyohito: *See—*
Inaba, Shigemitsu; Fukuda, Kiyohito; and Samejima, Masakuni, 310,996, Cl. D13-146.000.
Furco, Samuel J. Two-tier comb. 311,069, 10-2-90, Cl. D28-28.000.
Futter, Menachem; Wilson, James E.; and Golden, Annette M., to Revlon, Inc. Combined brush and powder dispenser. 310,917, 10-2-90, Cl. D4-114.000.
Futter, Menachem; Wilson, James E.; and Golden, Annette M., to Revlon, Inc. Combined brush and powder dispenser. 310,918, 10-2-90, Cl. D4-114.000.
Galaxy Machine Corporation: *See—*
Blevins, Gene, 311,070, Cl. D28-54.100.
Galli, Joseph, Jr.: *See—*
Alie, Enrique; and Galli, Joseph, Jr., 311,015, Cl. D16-202.000.
Gault, Robert L.: *See—*
Theisen, David A.; and Gault, Robert L., 311,065, Cl. D24-99.000.
General Motors Corporation: *See—*
Chandler, Maurice P., 310,990, Cl. D12-212.000.
North, David R.; and Stewart, Charles H., 310,989, Cl. D12-206.000.
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Law, Don C.; and Gibbs, Richard, 310,987, Cl. D12-156.000.
Golden, Annette M.: *See—*
Futter, Menachem; Wilson, James E.; and Golden, Annette M., 310,917, Cl. D4-114.000.
Futter, Menachem; Wilson, James E.; and Golden, Annette M., 310,918, Cl. D4-114.000.
Goldmeier, Steve: *See—*
Nagengast, Kenneth; and Goldmeier, Steve, 310,921, Cl. D6-361.000.
Goldmeier, Steven, to Rand International. Tricycle. 310,983, 10-2-90, Cl. D12-112.000.
Goodner, Douglas E.; Kline, Jeffrey L.; and Roberti, Anthony M., to International Business Machines Corporation. Printer. 311,021, 10-2-90, Cl. D18-13.000.
Goodyear Tire & Rubber Company, The: *See—*
Covert, Darrell E.; Hammond, Philip S.; and Maxwell, Paul B., 310,985, Cl. D12-147.000.
Covert, Darrell E.; and Maxwell, Paul B., 310,986, Cl. D12-147.000.
Grange, Kenneth, to Polaroid Corporation. Spectacles with apertured frame or similar article. 311,012, 10-2-90, Cl. D16-102.000.
Green, Morgan. Mobile firewood carrier. 311,060, 10-2-90, Cl. D23-410.000.
Halm, Hans; and Weltgen, Paul-Otto, to Henkel Kommanditgesellschaft auf Aktien. Container with spray dispenser top. 310,957, 10-2-90, Cl. D9-300.000.
Hammond, Philip S.: *See—*
Covert, Darrell E.; Hammond, Philip S.; and Maxwell, Paul B., 310,985, Cl. D12-147.000.
Hara, Shintaro: *See—*
Saito, Toshiaki; and Hara, Shintaro, 310,936, Cl. D8-67.000.
Hase, Yoshiaki, to Asics Corporation. Front sole reinforcement plate. 310,906, 10-2-90, Cl. D2-314.000.
Hassel, H. Charles; and Nash, Alan W. B., to MicroComputer Accessories Inc. Vertical stand for central processing unit. 311,001, 10-2-90, Cl. D14-114.000.
Hawes, Robert E., Jr.; and Aaldenberg, Eric, to Esselte Pendaflex Corporation. Calendar tray. 311,024, 10-2-90, Cl. D19-20.000.
Head, Patrick M. C., to Williams Grand Prix Engineering Ltd. Model racing car. 311,038, 10-2-90, Cl. D21-137.000.
Henkel Kommanditgesellschaft auf Aktien: *See—*
Halm, Hans; and Weltgen, Paul-Otto, 310,957, Cl. D9-300.000.
Henna (Hair Health) Limited: *See—*
Waring, Caroline, 310,959, Cl. D9-367.000.
Hino, Ichiro; and Tsuchiya, Masayoshi, to Sony Corporation. Cassette tape recorder. 311,006, 10-2-90, Cl. D14-165.000.
Holladay, Barbara: *See—*
Holladay, Wayne; and Holladay, Barbara, 311,078, Cl. D32-61.000.
Holladay, Wayne; and Holladay, Barbara. Clamp for holding socks together when laundering. 311,078, 10-2-90, Cl. D32-61.000.
Holmens Bruk Aktiebolag: *See—*
Breger, Carl-Arne, 310,923, Cl. D6-522.000.
Breger, Carl-Arne, 310,924, Cl. D6-545.000.
Homark Associates Limited: *See—*
Start, Michael J., 310,935, Cl. D7-397.000.
Hotchkiss, Kenneth W.; and Woodward, Arthur B., to Proto-Tel, Inc. Lamp extractor and inserter. 310,949, 10-2-90, Cl. D8-14.000.
Hoyt, Earl, to Reckitt & Colman Inc. Bottle. 310,961, 10-2-90, Cl. D9-376.000.
Huska, Paul. Locking screw. 310,956. 10-2-90, Cl. D8-387.000.
Iacovelli, Marc R., to Rally Accessories, Inc. Rear view mirror. 310,988, 10-2-90, Cl. D12-187.000.
Iden, Marlin D., to Brunton Company, The. Combined compass and thermometer. 310,970, 10-2-90, Cl. D10-53.000.
Ikebe, Masaru: *See—*
Satoh, Takateru; Ikebe, Masaru; and Tanaka, Kimio, 311,002, Cl. D14-121.000.
Ikeda, Tetsuya, to Takara Co., Ltd. Reconfigurable toy vehicle. 311,042, 10-2-90, Cl. D21-150.000.
Ilukowicz, Robert J.; and Seifert, Rudolf. Panel spacer pad. 310,953, 10-2-90, Cl. D8-354.000.
Inaba, Shigemitsu; Fukuda, Kiyohito; and Samejima, Masakuni, to Yazaki Corporation. Housing for an electrical connector. 310,996, 10-2-90, Cl. D13-146.000.
Ing. C. Olivetti & C., S.p.A.: *See—*
Bellini, Mario, 311,000, Cl. D14-113.000.
Bellini, Mario, 311,019, Cl. D18-1.000.
Bellini, Mario, 311,020, Cl. D18-1.000.
International Business Machines Corporation: *See—*
Goodner, Douglas E.; Kline, Jeffrey L.; and Roberti, Anthony M., 311,021, Cl. D18-13.000.
Lee, Troy A.; Mendel, Peter J.; and Smith, Ronald A., 310,998, Cl. D14-100.000.
Invivo Research, Inc.: *See—*
Nelson, John R., 311,062, Cl. D24-17.000.
Isonaga, Yasuaki, to Sony Corporation. Television receiver. 311,003, 10-2-90, Cl. D14-126.000.
Isonaga, Yasuaki, to Sony Corporation. Combined tape recorder and radio receiver. 311,005, 10-2-90, Cl. D14-163.000.
Iwama, Takeshi, to Sony Corporation. Combined video tape recorder and television receiver. 311,004, 10-2-90, Cl. D14-129.000.
Jensen, Donald W., to Sullivan & Mann Lumber Co. Single clamp tree brace. 310,948, 10-2-90, Cl. D8-1.000.
John Manufacturing Limited: *See—*
Yuen, John S., 311,027, Cl. D19-73.000.
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Edwards, Cree A.; and Johnson, Larsh M., 310,973, Cl. D10-75.000.
Jones, David A. Clock face. 310,977, 10-2-90, Cl. D10-126.000.
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Kaga, Gary: *See—*
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Kason Industries, Inc.: *See—*
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Kastanek, Allan. Condiment turntable. 310,940, 10-2-90, Cl. D7-590.000.
Kaye, Paul S., to Lewisan Products, Inc. Powered drain cleaner. 311,076, 10-2-90, Cl. D32-14.000.
Keiko, Yasuaki: *See—*
Nakamura, Kazuo; and Keiko, Yasuaki, 311,077, Cl. D32-44.000.
Kelly, Michael B., to Quaker Oats Company, The. Educational toy viewing machine. 311,036, 10-2-90, Cl. D21-59.000.
Kennametal Inc.: *See—*
Niebauer, Kenneth L., 311,010, Cl. D15-139.000.
Klein, Kathy M.; and Klein, Shanna L. Animated alphabet font. 311,023, 10-2-90, Cl. D18-27.000.
Klein, Shanna L.: *See—*
Klein, Kathy M.; and Klein, Shanna L., 311,023, Cl. D18-27.000.
Kline, Jeffrey L.: *See—*
Goodner, Douglas E.; Kline, Jeffrey L.; and Roberti, Anthony M., 311,021, Cl. D18-13.000.
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Kruse, Gary L.; and Petersen, Bernard L., to Oliver Products Company. Countertop bread slicer. 310,933, 10-2-90, Cl. D7-381.000.
Kunihiro, Takashi, to Takara Co., Ltd. Reconfigurable toy tank. 311,040, 10-2-90, Cl. D21-150.000.
Kunihiro, Takashi, to Takara Co., Ltd. Reconfigurable toy vehicle. 311,043, 10-2-90, Cl. D21-150.000.
Kutza, James A. Sports car. 310,981, 10-2-90, Cl. D12-92.000.
Laid Back Enterprises, Inc.: *See—*
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Lam, Lawrence: *See—*
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Landisi, Ronald: *See—*
Rosenbaum, Saul; and Landisi, Ronald, 310,992, Cl. D13-170.000.
Lanigan, Sean M. K. Video tape label. 311,030, 10-2-90, Cl. D20-22.000.
LaRiviere, Tim. Game board. 311,034, 10-2-90, Cl. D21-20.000.
Law, Don C.; and Gibbs, Richard, to Brahma, Inc. Cover for the bed of a pickup truck. 310,987, 10-2-90, Cl. D12-156.000.
Lee, Troy A.; Mendel, Peter J.; and Smith, Ronald A., to International Business Machines Corporation. Expansion unit for a personal computer. 310,998, 10-2-90, Cl. D14-100.000.
Leszczak, John, to Bates Maufacturing Company, The. Numbering machine. 311,022, 10-2-90, Cl. D18-15.000.
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Lisitza, Mark R. Fly swatter. 311,050, 10-2-90, Cl. D22-124.000.

Loctite Corporation: *See—*
Butler, Anthony R., 310,969, Cl. D9-453.000.
Lutzker, Robert S. Infant's feeding spoon. 310,944, 10-2-90, Cl. D7-655.000.
Marchione, Robert. X-ray protective apron unit. 310,905, 10-2-90, Cl. D2-229.000.
Mark, Andrew. Headband radio. 310,907, 10-2-90, Cl. D2-512.000.
Marpac Corporation: *See—*
Theisen, David A.; and Gault, Robert L., 311,065, Cl. D24-99.000.
Martinoni, Giuseppe. Cap for a cosmetic container. 311,072, 10-2-90, Cl. D28-84.000.
Mason, Robert J. Nut opening tool. 310,947, 10-2-90, Cl. D7-693.000.
Matsuzaki Industry Co., Ltd.: *See—*
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Covert, Darrell E.; and Maxwell, Paul B., 310,986, Cl. D12-147.000.
Maxymych, Peter; Bourbonniere, Alan; Letendre, Michel; and Prijic, Nevenka, to Dompier Equities Ltd. Lighted credit card tablet. 310,910, 10-2-90, Cl. D3-56.000.
Mayhew, Boyd R. Van roof for customized conversion vans. 310,984, 10-2-90, Cl. D12-156.000.
McDonnell, Patrick F.: *See—*
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Mendel, Peter J.: *See—*
Lee, Troy A.; Mendel, Peter J.; and Smith, Ronald A., 310,998, Cl. D14-100.000.
Mervar, Bob; Murphy, Kent W.; and Craft, Charles W., Jr., to Rubbermaid Incorporated. Wall pocket file. 310,925, 10-2-90, Cl. D6-567.000.
MicroComputer Accessories Inc.: *See—*
Hassel, H. Charles; and Nash, Alan W. B., 311,001, Cl. D14-114.000.
Mitsubayashi, Yoshihiko, to Chubu Industries, Inc. Machine for making soft ice drink. 310,932, 10-2-90, Cl. D7-378.000.
Mollenhoff, David V. Hot beverage maker or the like. 310,931, 10-2-90, Cl. D7-309.000.
Monnet, Rene P., to Facom, S.A. Pair of pliers. 310,951, 10-2-90, Cl. D8-52.000.
Murphy, Kent W., to Rubbermaid Incorporated. Storage rack for cleaning supplies. 310,928, 10-2-90, Cl. D6-574.000.
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Mervar, Bob; Murphy, Kent W.; and Craft, Charles W., Jr., 310,925, Cl. D6-567.000.
Myrtle, Raymond P. Volleyball stand support. 311,048, 10-2-90, Cl. D21-199.000.
Nagengast, Kenneth; and Goldmeier, Steve, to Rand International. Swivel lounge chair. 310,921, 10-2-90, Cl. D6-361.000.
Nakamura, Kazuo; and Keiko, Yasuaki, to Yamazaki Corporation. Combined mop and wringer. 311,077, 10-2-90, Cl. D32-44.000.
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Hassel, H. Charles; and Nash, Alan W. B., 311,001, Cl. D14-114.000.
Nelson, John R., to Invivo Research, Inc. Housing for medical instrument. 311,062, 10-2-90, Cl. D24-17.000.
Neuman, Perry. Carpenter's gauge for installing trim around doors and windows. 310,972, 10-2-90, Cl. D10-65.000.
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Wilkinson, Andrew E.; and Andersson, Karl E. P., 310,974, Cl. D10-82.000.
Niebauer, Kenneth L., to Kennametal Inc. Cutting tool insert. 311,010, 10-2-90, Cl. D15-139.000.
Nielsen, Robert B. Holder for advertising display or the like. 311,029, 10-2-90, Cl. D20-10.000.
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Nordstrom, Michael D.; and Armstrong, Bob, to Advanced Recycling Systems Inc. Cart for refuse containers. 311,082, 10-2-90, Cl. D34-24.000.
North, David R.; and Stewart, Charles H., to General Motors Corporation. Wheel cover. 310,989, 10-2-90, Cl. D12-206.000.
Nuttall, Michael J.; and Lam, Lawrence, to Bell & Howell Publication Systems Company. Electronic enclosure or similar article. 310,999, 10-2-90, Cl. D14-102.000.
Ohkura, Kenzi; and Sugata, Sho-Ichi, to Sumitomo Wiring Systems, Ltd. Electrical connector assembly. 310,993, 10-2-90, Cl. D13-146.000.
Olesen, Paul; and McDonnell, Patrick F., to Swingline Inc. Motorized stapler. 310,950, 10-2-90, Cl. D8-49.000.
Oliver Products Company: *See—*
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Porsche, Ferdinand A., 311,011, Cl. D16-102.000.
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Parks, Larry R. Boomerang. 311,037, 10-2-90, Cl. D21-82.000.
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Patterson, Don. End cap for a tube. 311,056, 10-2-90, Cl. D23-260.000.
Perry, Constance A. Earring. 310,979, 10-2-90, Cl. D11-43.000.
Persaud, Vishnu. Unitary thumbtack and hook. 310,954, 10-2-90, Cl. D8-367.000.
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Peterson, Robert J., to Swede Industries, Inc. Fishing reel. 311,051, 10-2-90, Cl. D22-141.000.
Pierce, Alfred R., Jr. Limb protector. 311,075, 10-2-90, Cl. D29-20.000.
Pittway Corporation: *See—*
Fenne, Kenneth R., 311,066, Cl. D26-46.000.
Platten, Conrad M., to Wrightson NMA Limited. Electrical fence clip. 310,955, 10-2-90, Cl. D8-382.000.
Poitras, Leandre. Baseball pitching practice device. 311,031, 10-2-90, Cl. D21-5.000.
Polaroid Corporation: *See—*
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Futter, Menachem; Wilson, James E.; and Golden, Annette M., 310,918, Cl. D4-114.000.
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Roberti, Anthony M.: *See—*
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Roethling, Dirk, to Max Zapf, Firma. Container for dolls. 310,967, 10-2-90, Cl. D9-418.000.
Rosenbaum, Saul; and Landisi, Ronald, to Leviton Manufacturing Co., Inc. Combined cover plate and switches for electronic wiring device. 310,992, 10-2-90, Cl. D13-170.000.
Rubbermaid Incorporated: *See—*
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Saito, Toshiaki; and Hara, Shintaro, to Ryobi Ltd. Power hammer drill. 310,936, 10-2-90, Cl. D8-67.000.
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Sakai, Seiji. Photostand. 310,919, 10-2-90, Cl. D6-311.000.
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Arduini, Giovanni; Bonfanti, Lorenzo; and Salvemini, Gianfranco, 310,975, Cl. D10-106.000.
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Inaba, Shigemitsu; Fukuda, Kiyohito; and Samejima, Masakuni, 310,996, Cl. D13-146.000.
Sanchez, Robert P. Golf club head. 311,049, 10-2-90, Cl. D21-219.000.
Santore, Anthony. Combined shoehorn and hosiery donning aid. 310,908, 10-2-90, Cl. D2-642.000.
Satoh, Takateru; Ikebe, Masaru; and Tanaka, Kimio, to TDK Corporation. Magnetic tape cassette. 311,002, 10-2-90, Cl. D14-121.000.
Satoh, Yasuta; and Saitoh, Shinya, to Takara Co., Ltd. Motor driven toy cactus. 311,044, 10-2-90, Cl. D21-150.000.
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Scott, Charles L.; Scott, Janet S.; and Scott, Brenda J. Jewelry display rack. 310,927, 10-2-90, Cl. D6-571.000.
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Scott, Terry B.; and Scott, Donna, 311,074, Cl. D29-19.000.
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Segati, Umberto D. L, to Colgate-Palmolive Co. Combined bottle and cap. 310,963, 10-2-90, Cl. D9-404.000.
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Shih-Chuan, Huang. Fan heater. 311,059, 10-2-90, Cl. D23-335.000.
Shinohara, Muneyoshi, to Takara Co., Ltd. Reconfigurable toy mixer truck. 311,041, 10-2-90, Cl. D21-150.000.
Sigmund, Jerry A., to Scott Paper Company. Double toilet paper roll dispenser. 310,922, 10-2-90, Cl. D6-520.000.
Smith, Ronald A.: *See—*
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Iwama, Takeshi, 311,004, Cl. D14-129.000.
Tejima, Keisuke, 311,014, Cl. D16-202.000.
Speers, Samuel F., to Design Data, Inc. Emergency medical information container. 310,966, 10-2-90, Cl. D9-418.000.
Spencer, William E., Sr. Bottle drain coupling. 310,943, 10-2-90, Cl. D7-619.000.
Stahmann Farms Incorporated: *See—*
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Stairs, Henry M., Jr., to American Standard Inc. Toilet or the like. 311,057, 10-2-90, Cl. D23-295.000.
Start, Michael J., to Homark Associates Limited. Stanchion for a beverage tap. 310,935, 10-2-90, Cl. D7-397.000.
Stefano, Vanoncini, to Brivaplast S.r.l. Make-up case. 311,071, 10-2-90, Cl. D28-77.000.
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Theisen, David A.; and Gault, Robert L., to Marpac Corporation. Sound conditioner for masking intruding noises. 311,065, 10-2-90, Cl. D24-99.000.
Theurillat, Michel, to Juvenia Horlogerie de Precision S.A. Watch dial. 310,976, 10-2-90, Cl. D10-125.000.
Tholberg, Ronald W. Holder for cellular telephone. 310,997, 10-2-90, Cl. D14-65.000.
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Tsuchiya, Masayoshi: *See—*
Hino, Ichiro; and Tsuchiya, Masayoshi, 311,006, Cl. D14-165.000.
Unger, Steve A., to Syracuse China Corporation. Plate or similar article. 310,930, 10-2-90, Cl. D7-586.000.
Utas-Sjoberg, Jan M. R., to Astra Meditec Aktiebolag. Catheter package. 311,064, 10-2-90, Cl. D24-54.000.
Verebelyi, Nicholas B., to Reckitt & Colman Products Limited. Bottle with cap. 310,960, 10-2-90, Cl. D9-373.000.
Vigil, Ronald J. Pill dispenser. 310,938, 10-2-90, Cl. D7-589.000.
Vrana, Edward E.; and Bansal, Ravinder K., to AirSep Corporation. Air separator. 311,061, 10-2-90, Cl. D24-8.000.
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Bubik, Leslie, 310,980, Cl. D12-14.000.
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Waring, Caroline, to Henna (Hair Health) Limited. Bottle. 310,959, 10-2-90, Cl. D9-367.000.
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Blake, Larry D., 311,079, Cl. D34-15.000.
Watanabe, Makiko, to Tomy Kogyo Co., Inc. Water game. 311,032, 10-2-90, Cl. D21-12.000.
Weckman, Richard L., to Owens-Brockway Glass Container Inc. Bottle. 310,964, 10-2-90, Cl. D9-408.000.
Weltgen, Paul-Otto: *See—*
Halm, Hans; and Weltgen, Paul-Otto, 310,957, Cl. D9-300.000.
White, Jeffrey R. Tortilla warmer. 310,946, 10-2-90, Cl. D7-683.000.
Wilkins, Robert W. Grass trimmer attachment for lawn mowers. 311,009, 10-2-90, Cl. D15-17.000.
Wilkinson, Andrew E.; and Andersson, Karl E. P., to Nicator AB. Wheel camber meter mounting. 310,974, 10-2-90, Cl. D10-82.000.
Williams Grand Prix Engineering Ltd.: *See—*
Head, Patrick M. C., 311,038, Cl. D21-137.000.
Wilson, Donald H.: *See—*
Arnott, John; Wilson, Donald H.; Kaga, Gary; and Somoza, Vincent, 311,080, Cl. D34-21.000.
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Futter, Menachem; Wilson, James E.; and Golden, Annette M., 310,918, Cl. D4-114.000.
Woodall, Erica. Baby bottle insulator. 310,942, 10-2-90, Cl. D7-607.000.
Woodward, Arthur B.: *See—*
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Yagi, Sakai; and Yashima, Norimichi, to Yazaki Corporation. Housing for an electrical connector. 310,994, 10-2-90, Cl. D13-146.000.
Yamamoto, Takayuki, to Yazaki Corporation. Housing for an electrical connector. 310,995, 10-2-90, Cl. D13-146.000.
Yamazaki Corporation: *See—*
Nakamura, Kazuo; and Keiko, Yasuaki, 311,077, Cl. D32-44.000.
Yaneck, Theresa M. Toy animal figure. 311,046, 10-2-90, Cl. D21-159.000.
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Yamamoto, Takayuki, 310,995, Cl. D13-146.000.
Yokoyama, Kaori, to Tomy Kogyo Co., Inc. Rotatable game housing. 311,033, 10-2-90, Cl. D21-12.000.
Yoshida, Michio; and Kodaira, Takanori, to Canon Kabushiki Kaisha. Camera. 311,017, 10-2-90, Cl. D16-209.000.
Yuen, John S., to John Manufacturing Limited. Combined pencil sharpener and holder for writing instruments. 311,027, 10-2-90, Cl. D19-73.000.

LIST OF PLANT PATENTEES

Barnfield, Delwyn: *See*—
Barnfield, Wayne M., 7,342, Cl. 45.000.

Barnfield, Wayne M., to Barnfield, Delwyn. Distinct variety of orange named Barnfield Late Navel. 7,342, 10-2-90, Cl. 45.000.

Bloom, Adrian J.: *See*—
Bloom, Alan H.; and Bloom, Adrian J., 7,344, Cl. 68.000.

Bloom, Alan H.; and Bloom, Adrian J., to Blooms of Bressingham Ltd. Bergenia "Bressingham Ruby". 7,344, 10-2-90, Cl. 68.000.

Blooms of Bressingham Ltd.: *See*—
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Conard-Pyle Company, The: *See*—
Suzuki, Seizo, 7,341, Cl. 21.000.

Craig, Richard; and Hanniford, Glenn G., to Research Corporation Technologies, Inc. Regal Pelargonium 'Crystal'. 7,343, 10-2-90, Cl. 68.000.

Hanniford, Glenn G.: *See*—
Craig, Richard; and Hanniford, Glenn G., 7,343, Cl. 68.000.

Jolly, Marie. Rose plant named 'Tipper'. 7,340, 10-2-90, Cl. 9.000.

Kientzler, Ludwig, to Paul Ecke Ranch. Impatiens plant named Jasius. 7,345, 10-2-90, Cl. 68.000.

Paul Ecke Ranch: *See*—
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Research Corporation Technologies, Inc.: *See*—
Craig, Richard; and Hanniford, Glenn G., 7,343, Cl. 68.000.

Suzuki, Seizo, to Conard-Pyle Company, The. Rose plant — Keijourna variety. 7,341, 10-2-90, Cl. 21.000.

VandenBerg, Cornelis P., to Yoder Brothers, Inc. Chrysanthemum plant named Pasadena. 7,346, 10-2-90, Cl. 74.000.

Yoder Brothers, Inc.: *See*—
VandenBerg, Cornelis P., 7,346, Cl. 74.000.

LIST OF STATUTORY INVENTION REGISTRATIONS

APPLICANTS TO WHOM

STATUTORY INVENTION REGISTRATIONS WERE ISSUED ON THE 2ND DAY OF OCTOBER, 1990

Arismendi, Andy M., Jr.: *See*—
Willis, Carl L.; and Arismendi, Andy M., Jr., H826, Cl. 252-51.50A.

Armstrong, John W.; Hu, Benjamin K. S.; Brown, Steven A.; and Hasen, James D., to United States of America, Agriculture. Hot air disinfestation of fruit and vegetables. H828, 10-2-90, Cl. 426-615.000.

Behl, Wishvender K., to United States of America, Army. Rechargeable lithium-organic electrolyte battery having overcharge protection and method of providing overcharge protection for a lithium-organic electrolyte battery. H829, 10-2-90, Cl. 429-194.000.

Brown, Steven A.: *See*—
Armstrong, John W.; Hu, Benjamin K. S.; Brown, Steven A.; and Hasen, James D., H828, Cl. 426-615.000.

Conkle, James P.; and Sears, William J., to United States of America, Air Force. Chemical protective balaclava. H823, 10-2-90, Cl. 2-410.000.

Deguchi, Naoyasu; Ueda, Shinji; and Nakamura, Koki. Silver halide color photographic material. H830, 10-2-90, Cl. 430-542.000.

Dixon, Samuel, Jr., to United States of America, Army. Planar monolithic self-oscillating mixer. H832, 10-2-90, Cl. 455-327.000.

Exxon Production Research Company: *See*—
Green, Joe R., H825, Cl. 62-20.000.

Ghafoorzai, Serkai. Plant stem holder. H824, 10-2-90, Cl. 47-44.000.

Green, Joe R., to Exxon Production Research Company. Process for conditioning a high carbon dioxide content natural gas stream for gas sweetening. H825, 10-2-90, Cl. 62-20.000.

Hasen, James D.: *See*—
Armstrong, John W.; Hu, Benjamin K. S.; Brown, Steven A.; and Hasen, James D., H828, Cl. 426-615.000.

Hokanson, James S.: *See*—
Salanitro, Joseph P.; and Hokanson, James S., H831, Cl. 435-34.000.

Hu, Benjamin K. S.: *See*—
Armstrong, John W.; Hu, Benjamin K. S.; Brown, Steven A.; and Hasen, James D., H828, Cl. 426-615.000.

Nakamura, Koki: *See*—
Deguchi, Naoyasu; Ueda, Shinji; and Nakamura, Koki, H830, Cl. 430-542.000.

Salanitro, Joseph P.; and Hokanson, James S., to Shell Oil Company. Tubular biofilm reactor. H831, 10-2-90, Cl. 435-34.000.

Sears, William J.: *See*—
Conkle, James P.; and Sears, William J., H823, Cl. 2-410.000.

Shell Oil Company: *See*—
Salanitro, Joseph P.; and Hokanson, James S., H831, Cl. 435-34.000.

Ueda, Shinji: *See*—
Deguchi, Naoyasu; Ueda, Shinji; and Nakamura, Koki, H830, Cl. 430-542.000.

United States of America
Agriculture: *See*—
Armstrong, John W.; Hu, Benjamin K. S.; Brown, Steven A.; and Hasen, James D., H828, Cl. 426-615.000.
Air Force: *See*—
Conkle, James P.; and Sears, William J., H823, Cl. 2-410.000.
Army: *See*—
Behl, Wishvender K., H829, Cl. 429-194.000.
Dixon, Samuel, Jr., H832, Cl. 455-327.000.

Willis, Carl L.; and Arismendi, Andy M., Jr. Lubricant compositions containing a viscosity index improver having dispersant properties. H826, 10-2-90, Cl. 252-51.50A.

Yamagishi, Kouichi. Process for manufacturing molded outer covering. H827, 10-2-90, Cl. 264-73.000.

CLASSIFICATION OF PATENTS

ISSUED OCTOBER 2, 1990

NOTE.—First number, class; second number, subclass; third number, patent number

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93	4,959,876

CLASS 5

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424	4,959,878
434	4,959,879
	4,959,880

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94.26	4,960,429
114	4,960,430
115.6	4,960,431
411	4,960,432
506	4,960,433
524	4,960,434
526	4,960,435

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510	4,959,892

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282	4,959,895

CLASS 29

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705	4,959,898
726	4,959,899
840	4,959,900
898.07	4,959,902

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298.4	4,959,905
381	4,959,906
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CLASS 33

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501.1	4,959,909
623	4,959,910

CLASS 34

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CLASS 36

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	4,959,913
120	4,959,914

CLASS 37

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CLASS 40

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CLASS 42

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98	4,959,918

CLASS 43

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42.47	4,959,920
44.99	4,959,921
100	4,959,922
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114	4,959,924
125	4,959,925

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CLASS 47

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CLASS 49

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295	4,960,442
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462	4,959,939
583	4,959,940
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378	4,959,945
415	4,959,946
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45	4,960,443
67	4,960,444
312	4,960,446
390	4,960,447
523	4,960,448
	4,960,449

CLASS 56

328.1	4,959,949
340.1	4,959,950

CLASS 57

58.52	4,959,951
261	4,959,952
354	4,959,953

CLASS 60

39.02	4,959,954
204	4,959,955
323	4,959,956
413	4,959,957
415	4,959,958
489	4,959,959
533	4,959,960
612	4,959,961
626	4,959,962
646	4,959,963

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51.1	4,959,964
129	4,959,965
138	4,959,966
	4,959,967
155	4,959,968
157	4,959,969
176.1	4,959,970
197	4,959,971
200	4,959,972
225	4,959,973
228.5	4,959,974
238.6	4,959,975
271	4,959,976

CLASS 65

3.2	4,960,451

CLASS 69

6.5	4,959,977

CLASS 70

25	4,959,978
58	4,959,979
158	4,959,980
238	4,959,981
248	4,959,982
456 R	4,959,983

CLASS 71

26	4,960,452
92	4,960,453
	4,960,454
	4,960,455
	4,960,456
95	4,960,457

CLASS 72

20	4,959,984
97	4,959,985
129	4,959,986
247	4,959,987
421	4,959,988
450	4,959,989
457	4,959,991

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35	4,959,993
38	4,959,994
54	4,959,995
116	4,959,996
202	4,959,990
308	4,959,997
626	4,959,998
755	4,959,999
778	4,960,000
862.67	4,960,001
864.67	4,960,002

CLASS 74

63	4,960,003
89.15	4,960,007
200	4,960,004
329	4,960,005
384	4,960,006
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	4,960,009
594.3	4,960,013
640	4,960,010
650	4,960,011

CLASS 75

10.19	4,960,460
252	4,960,462

CLASS 81

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	4,960,015
177.4	4,960,016
459	4,960,017

CLASS 83

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19	4,960,019
34	4,960,020
120	4,960,021
175	4,960,022
368	4,960,023
423	4,960,024
703	4,960,025
818	4,960,026

CLASS 84

307	4,960,027
421	4,960,028
473	4,960,029
609	4,960,030
	4,960,031

CLASS 89

1.51	4,960,032
28.05	4,960,033

CLASS 91

445	4,960,035
491	4,960,034

CLASS 92

63	4,960,036
88	4,960,037
98 R	4,960,038
165 R	4,960,039
261	4,960,040

CLASS 98

1.5	4,960,041

CLASS 99

293	4,960,042
353	4,960,043
458	4,960,044

CLASS 100

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93 RP	4,960,046

CLASS 101

27	4,960,047
182	4,960,048
217	4,960,049
348	4,960,050
349	4,960,051
350	4,960,052
	4,960,053
451	4,960,054

CLASS 102

489	4,960,055

CLASS 106

1.29	4,960,466
11	4,960,463
19	4,960,464
209	4,960,467
724	4,960,465

CLASS 110

233	4,960,056
336	4,960,058
345	4,960,057
347	4,960,059

CLASS 111

128	4,960,060

CLASS 112

103	4,960,061
255	4,960,062

CLASS 114

39.2	4,960,063
61	Re.33,359
230	4,960,064
254	4,960,065
361	4,960,066

CLASS 116

28 R	4,960,067

CLASS 118

123	4,960,068
657	4,960,069
658	4,960,070
722	4,960,071
723	4,960,072
	4,960,073

CLASS 119

20	4,960,074
29	4,960,075
	4,960,076
106	4,960,077

CLASS 122

24	4,960,078
504.2	4,960,079

CLASS 123

41.31	4,960,081
43 A	4,960,082
90.16	4,960,083
90.17	4,960,084
179 F	4,960,085
190 DL	4,960,086
198 D	4,960,087
	4,960,088
254	4,960,080
260	4,960,089
399	4,960,090
	4,960,091
414	4,960,092
416	4,960,093
425	4,960,094
	4,960,095
494	4,960,097
570	4,960,096
589	4,960,098
647	4,960,099

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110 R	4,960,102
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72	4,960,111
78	4,960,112
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87 R	4,960,114
	4,960,115
90	4,960,116
200.24	4,960,118
204.18	4,960,119
205.22	4,960,120
206.24	4,960,121
207.14	4,960,122
419 D	4,960,123
421	4,960,124
	4,960,125
633	4,960,126
675	Re.33,360
	4,960,127
677	4,960,128
695	4,960,129
736	4,960,109
760	4,960,130
774	4,960,131
776	4,960,132
784	4,960,133
786	4,960,134
845	4,960,136

CLASS 132

73	4,960,138

CLASS 134

31	4,960,140
61	4,960,141
138	4,960,142
199	4,960,143

CLASS 135

101	4,960,144

CLASS 136

259	4,960,468

CLASS 137

38	4,960,145
39	4,960,146
45	4,960,147
122	4,960,148
205	4,960,149
234.6	4,960,150
376	4,960,151
559	4,960,152
587	4,960,153
625.17	4,960,154
625.46	4,960,139

CLASS 138

178	4,960,155

CLASS 141

1	4,960,156

CLASS 144

34 R	4,960,157
349	4,960,137

CLASS 148

12 B	4,960,473
12 E	4,960,470
20.3	4,960,471
105	4,960,469
127	4,960,472
156	4,960,158
302	4,960,474

CLASS 149

2	4,960,475

CLASS 152

216	4,960,159
	4,960,160

CLASS 156

138	4,960,476
209	4,960,477
228	4,960,478
251	4,960,479
256	4,960,480
272.4	4,960,481
277	4,960,482
290	4,960,483
499	4,960,484
556	4,960,485
633	4,960,486
643	4,960,487
	4,960,488
652	4,960,489
656	4,960,490
668	4,960,491

CLASS 160

126	4,960,161

CLASS 162

301	4,960,492

CLASS 164

5	4,960,162
459	4,960,163
480	4,960,164
491	4,960,165

CLASS 165

9	4,960,166
40	4,960,167
92	4,960,168
173	4,960,169
184	4,960,170

CLASS 166

55	4,960,171
208	4,960,172
241	4,960,173
342	4,960,174

CLASS 174

51	4,960,964
102 R	4,960,965

CLASS 175

86	4,960,175
424	4,960,176

CLASS 177

210 C	4,960,177

CLASS 180

8.2	4,960,179
9.28	4,960,180
79.1	4,960,178
179	4,960,182

CLASS 181

106	4,960,181
107	4,960,183
287	4,960,184

CLASS 182

38	4,960,185

CLASS 187

20	4,960,186

CLASS 188

24.12	4,960,187
299	4,960,188

CLASS 192

41 A	4,960,189
56 F	4,960,190
58 B	4,960,191
67 R	4,960,192
91 A	4,960,193
103 B	4,960,194

CLASS 193

44	4,960,195

CLASS 194

215	4,960,196

CLASS 198

419.2	4,960,198
494	4,960,199

495 4,960,200
621 4,960,197
732 4,960,201
781 4,960,202
802 4,960,203

CLASS 200

61.41 4,960,966

CLASS 202

263 4,960,499

CLASS 204

32.1 4,960,493
67 4,960,494
129.3 4,960,495
153.13 4,960,496
153.16 4,960,497
192.2 4,960,498
244 4,960,501
269 4,960,500

CLASS 206

235 4,960,204
387 4,960,205
444 Re.33,361
456 4,960,224
459 4,960,206
507 4,960,207
581 4,960,208
597 4,960,209

CLASS 208

85 4,960,502
4,960,503
143 4,960,505
215 4,960,506
254 R 4,960,507
4,960,508
411 4,960,504

CLASS 209

164 4,960,509
405 4,960,510

CLASS 210

96.1 4,960,511
4,960,512
104 4,960,513
169 4,960,514
195.1 4,960,515
198.2 4,960,516
639 4,960,517
4,960,518
640 4,960,519
4,960,520
644 4,960,521
701 4,960,522
721 4,960,523
747 4,960,524
788 4,960,525

CLASS 211

59.2 4,960,210
60.1 4,960,211
70.2 4,960,212
123 4,960,213
133 4,960,214

CLASS 213

33 4,960,215

CLASS 215

232 4,960,216
271 4,960,217
311 4,960,218
354 4,960,219

CLASS 219

10.491 4,960,967
69.12 4,960,971
78.01 4,960,968
85.12 4,960,972
91.2 4,960,969
121.6 4,960,970
121.64 4,960,973
137 R 4,960,974
241 4,960,975
388 4,960,977
455 4,960,978
549 4,960,979

CLASS 220

3 4,960,221
5 A 4,960,222
7 4,960,223
23.83 4,960,220
85 H 4,960,225

CLASS 221

202 4,960,226

CLASS 222

94 4,960,227
129.1 4,960,228
161 4,960,229
321 4,960,230

CLASS 224

103 4,960,231
179 4,960,232
250 4,960,233

CLASS 226

15 4,960,234

CLASS 227

19 Re.33,362
147 4,960,235

CLASS 228

180.1 4,960,236

CLASS 229

73 4,960,237
125.29 4,960,238

CLASS 235

78 RC 4,960,980
379 4,960,981
382 4,960,982
449 4,960,983
462 4,960,984
467 4,960,985

CLASS 239

56 4,960,240
90 4,960,241
168 4,960,242
265.29 4,960,243
424 4,960,244
597 4,960,245

CLASS 241

169.1 4,960,246
188 R 4,960,247

CLASS 242

55.53 4,960,248

CLASS 244

118.5 4,960,249
164 4,960,250

CLASS 246

169 A 4,960,251

CLASS 248

56 4,960,252
68.1 4,960,253
146 4,960,254
156 4,960,255
284 4,960,256
442.2 4,960,257
467 4,960,258

CLASS 250

201.7 4,960,986
213 VT 4,960,987
4,960,988
227.15 4,960,989
251 4,960,990
281 4,960,991
288 4,960,992
327.2 4,960,993
4,960,994
347 4,960,995
349 4,960,996
368 4,960,997
398 4,961,003
432 R 4,960,998
461.1 4,960,999
483.1 4,961,004
484.1 4,961,000
491.1 4,961,001

CLASS 251

7 4,960,259
127 4,960,260
148 4,960,261
315 4,960,262
352 4,960,263

CLASS 252

8.551 4,960,527
8.8 4,960,526
32 4,960,528
32.5 4,960,529
32.7 R 4,960,530
70 4,960,531
88 4,960,532
142 4,960,533
145 4,960,534
171 4,960,535
174.19 4,960,536
182.28 4,960,537
299.2 4,960,538
299.5 4,960,539
358 4,960,540
546 4,960,541
565 4,960,542

CLASS 254

8 B 4,960,264
93 R 4,960,265
134.3 PA 4,960,266

CLASS 260

420 4,960,544

CLASS 261

41.5 4,960,545
122 4,960,546

CLASS 264

11 4,960,547
40.4 4,960,548
45.5 4,960,549
56 4,960,550
65 4,960,551
108 4,960,552
113 4,960,553
219 4,960,554
288.4 4,960,555
322 4,960,556
328.12 4,960,557
510 4,960,558

CLASS 267

91 4,960,267

CLASS 269

43 4,960,268
87.2 4,960,269
282 4,960,270
323 4,960,271

CLASS 271

3.1 4,960,272
10 4,960,273

CLASS 272

8 M 4,960,274
32 4,960,275
97 4,960,276
123 4,960,277

CLASS 273

32 B 4,960,239
4,960,278
148 B 4,960,117
164 4,960,279
189 R 4,960,280
232 4,960,281
4,960,282
4,960,283
395 4,960,284

CLASS 279

123 4,960,285

CLASS 280

247 4,960,286
304.1 4,960,287
423.1 4,960,288
630 4,960,289
692 4,960,290
710 4,960,291
731 4,960,292
749 4,960,293
848 4,960,294

CLASS 281

15.1 4,960,295

CLASS 285

50 4,960,296

CLASS 290

40 B 4,959,896

CLASS 292

223 4,960,297

CLASS 294

64.1 4,960,298

CLASS 296

26 4,960,299
34 4,960,300
39.2 4,960,301
100 4,960,302

CLASS 297

159 4,960,303
284 4,960,304
423 4,960,305

CLASS 299

41 4,960,306

CLASS 307

201 4,961,002
4,961,005
270 4,961,006
296.2 4,961,007
296.3 4,961,008
296.8 4,961,009
443 4,961,010
446 4,961,011
465 4,961,012
480 4,961,013
520 4,961,014
572 4,961,015

CLASS 310

62 4,961,016
71 4,961,017
87 4,961,018

CLASS 312

194 4,960,307
214 4,960,308
221 4,960,309

CLASS 313

25 4,961,019
025 4,961,020
412 4,961,021
414 4,961,022
456 4,961,023
493 4,961,024
524 4,961,025
525 4,961,026
561 4,961,040

CLASS 315

58 4,961,027
91 4,961,028
219 4,961,029
293 B1 3,845,351
368 4,961,030
382 4,961,031
397 4,961,032

CLASS 318

560 4,961,033
578 4,961,041
600 4,961,034
4,961,035
603 4,961,036
696 4,961,037
4,961,038
758 4,961,042

CLASS 320

21 4,961,043

CLASS 323

205 4,961,044
273 4,961,045
315 4,961,046
322 4,961,047
351 4,961,048

CLASS 324

117 H 4,961,049
158 F 4,961,050
158 P 4,961,052
158 R 4,961,053
322 4,961,054
415 4,961,051
446 4,961,147
662 4,961,055

CLASS 328

235 4,961,056

CLASS 330

295 4,961,057

CLASS 331

9 4,961,058

CLASS 333

19 4,961,059
140 4,961,060
156 4,961,061
164 4,961,062

CLASS 337

241 4,961,063

CLASS 338

32 S 4,961,066
231 4,961,064
308 4,961,065

CLASS 340

146.2 4,961,067
554 4,961,039
616 4,961,068
619 4,961,069
721 4,961,070
4,961,071
731 4,961,072
825.44 4,961,073

CLASS 342

20 4,961,074
140 4,961,075

CLASS 346

1.1 4,961,076
4,961,077
76 PH 4,961,078
108 4,961,079
4,961,080
140 R 4,961,081
4,961,082

CLASS 350

1.7 4,960,310
3.66 4,960,311
3.7 4,960,314
3.71 4,960,312
6.1 4,960,313
96.18 4,960,315
96.21 4,960,316
4,960,317
96.23 4,960,318
96.29 4,960,319
171 4,960,320
255 4,960,321
354 4,960,322
357 4,960,323
4,960,324
363 4,960,325

CLASS 351

41 4,960,326
221 4,960,327

CLASS 354

145.1 4,961,083
268 4,961,084
295 4,961,085

CLASS 355

29 4,961,093
41 4,961,086
50 4,961,090
71 4,961,087
206 4,961,088
207 4,961,089
321 4,961,091
323 4,961,092
326 4,961,094

CLASS 356

5 4,960,329
36 4,960,330
350 4,960,331
376 4,960,332

CLASS 357

22 4,961,194
23.6 4,961,095
30 4,961,096
4,961,097
4,961,098
38 4,961,099
39 4,961,100
49 4,961,101
51 4,961,102
59 4,961,103
71 4,961,104
72 4,961,105
74 4,961,106
81 4,961,107

CLASS 358

31 4,961,108
84 4,961,109
98 4,961,110
100 4,961,111
141 4,961,112
167 4,961,113
183 4,961,114
229 4,961,115
343 4,961,116
461 4,961,117
497 4,961,118

CLASS 360

85 4,961,120
103 4,961,121
107 4,961,122
131 4,961,123
132 4,961,124

CLASS 361

383 4,961,125
398 4,961,126

CLASS 362

285 4,961,127

CLASS 363

16 4,961,128
40 4,961,129
41 4,961,130

CLASS 364

140 4,961,131
200 4,961,132
4,961,133
4,961,134
4,961,135
4,961,136
4,961,137
4,961,138
4,961,139
4,961,140
4,961,141
408 4,961,142
421 4,961,143
424.05 4,961,144
426.02 4,961,145
426.04 4,961,146
468 4,961,148
469 4,961,149
474.29 4,961,150
492 4,961,151
513 4,961,152
521 4,961,153
522 4,961,154
550 4,961,163
559 4,961,155
578 4,961,156
579 4,961,157
709.04 4,961,158
717 4,961,159
724.01 4,961,160
736.5 4,961,161
748 4,961,162

CLASS 365

177 4,961,164
182 4,961,165
189.01 4,961,166
189.09 4,961,167
189.11 4,961,168
189.12 4,961,169
190 4,961,170
230.05 4,961,171
230.06 4,961,172

CLASS 366

80 4,960,328

CLASS 367

96 4,961,173
97 4,961,174
142 4,961,175
4,961,181
155 4,961,176
197 4,961,177

CLASS 368

156 4,961,119

CLASS 369

103 4,961,178
124 4,961,182
275.4 4,961,183
288 4,961,179

CLASS 370

76 4,961,184
79 4,961,185
4,961,186
85.120 4,961,187
94.2 4,961,188
110.1 4,961,180
112 4,961,189

CLASS 371

8.2 4,961,190
22.1 4,961,191
37.1 4,961,192
37.2 4,961,193

CLASS 372

31 4,961,195
45 4,961,196
4,961,197
50 4,961,198
56 4,961,199
89 4,961,200
94 4,961,201
100 4,961,202

CLASS 375

1 4,961,203
8 Re.33,368
25 4,961,204
36 4,961,205
39 4,961,206

CLASS 376

261 4,960,559
272 4,960,560
352 4,960,561
416 4,960,562

CLASS 377

43 4,961,207

CLASS 378

17 4,961,208
29 4,961,209
73 4,961,210
181 4,961,213
197 4,961,214

CLASS 379

54 4,961,211
56 4,961,215
57 4,961,216
67 4,961,212
89 4,961,217
104 Re.33,369
347 4,961,218
398 4,961,219
413 4,961,220
4,961,222
449 4,961,223

CLASS 380
5 B1 4,695,901
21 4,961,221
25 4,961,224
28 4,961,225

CLASS 381
24 4,961,226
4,961,227
41 4,961,228
42 4,961,229
69.2 4,961,230
73.1 B1 4,024,535

CLASS 382
21 4,961,231

CLASS 384
448 4,960,333
484 4,960,335
486 4,960,334

CLASS 392
485 4,960,976

CLASS 400
61 4,960,336
248 4,960,337
636.1 4,960,338

CLASS 401
129 4,960,339
186 4,960,340

CLASS 403
24 4,960,341
4,960,342
171 4,960,343
316 4,960,344

CLASS 405
38 4,960,345
52 4,960,346
63 4,960,347
259 4,960,348
262 4,960,349

CLASS 406
84 4,960,350

CLASS 409
180 4,960,352

CLASS 410
20 4,960,353

CLASS 411
523 4,960,354

CLASS 414
408 4,960,355
537 4,960,356
667 4,960,357
684.3 4,960,358
686 4,960,359
755 4,960,360
786 4,960,361
797.4 4,960,362

CLASS 415
3.1 4,960,363

CLASS 417
174 4,960,364
222 4,960,365
4,960,366
4,960,367
312 4,960,368
536 4,960,369

CLASS 418
9 4,960,370
13 4,960,371
63 4,960,372
270 4,960,373

CLASS 419
23 4,960,563
63 4,960,459

CLASS 420
400 4,960,564

CLASS 422
61 4,960,565
65 4,960,566
83 4,960,567
4,960,568
186.19 4,960,569
186.21 4,960,570
194 4,960,571
245 4,960,572

CLASS 423
22 4,960,573
27 4,960,461
213.5 4,960,574
222 4,960,575
226 4,960,576
242 4,960,577
326 4,960,578
351 4,960,579
484 4,960,580
489 4,960,581
632 4,960,582
633 4,960,583
658.5 4,960,584

CLASS 424
1.1 4,960,815
7.1 4,960,585
52 4,960,586
61 4,960,587
71 4,960,588
78 4,960,590
93 4,960,591
442 4,960,589
445 4,960,594
450 4,960,595
458 4,960,596
537 4,960,592

CLASS 425
6 4,960,351
119 4,960,374
131.1 4,960,375
525 4,960,376

CLASS 426
3 4,960,597
107 4,960,598
281 4,960,599
310 4,960,600
504 4,960,601
534 4,960,602
536 4,960,603
557 4,960,604
582 4,960,605
602 4,960,606

CLASS 427
8 4,960,607
10 4,960,608
38 4,960,609
39 4,960,610
43.1 4,960,611
47 4,960,612
53.1 4,960,613
54.1 4,960,614
160 4,960,615
186 4,960,616
222 4,960,617
226 4,960,618
265 4,960,619
385.5 4,960,620
397.8 4,960,621
423 4,960,458

CLASS 428
15 4,960,622
31 4,960,623
34.5 4,960,639
35.1 4,960,624
35.3 4,960,625
36.92 4,960,626
64 4,960,627
81 4,960,628
97 Re.33,365
113 4,960,629
131 4,960,630
192 4,960,631
212 4,960,632
215 4,960,633
220 4,960,634
4,960,635
4,960,636
314.4 4,960,637
331 B1 4,518,654
342 4,960,638
368 4,960,640
383 4,960,641
407 4,960,642
4,960,644
408 4,960,643
432 4,960,645
471 4,960,646
472.1 4,960,647
476.3 4,960,648
574 4,960,649
594 4,960,650
607 4,960,651
611 4,960,652
613 4,960,653
614 4,960,654
704 4,960,656

CLASS 429
192 4,960,655
194 4,960,657

CLASS 430
7 4,960,658
23 4,960,659
49 4,960,660
4,960,661
64 4,960,662
70 4,960,663
109 4,960,664
4,960,666
110 4,960,665
114 4,960,667
122 4,960,668
137 4,960,669
138 4,960,670
175 4,960,671
264 4,960,672
271 4,960,673
284 4,960,674
311 4,960,675
326 4,960,676
331 4,960,677
332 4,960,678
335 4,960,679
346 4,960,680
351 4,960,681
393 4,960,682
428 4,960,683
467 4,960,684
505 4,960,685
522 4,960,686
527 4,960,687
548 4,960,688
603 4,960,689

CLASS 431
12 4,960,377
114 4,960,378

CLASS 432
3 4,960,379
175 4,960,380

CLASS 433
174 4,960,381

CLASS 434
164 4,960,382
409 Re.33,363
430 4,960,383

CLASS 435
6 4,960,690
4,960,691
7 4,960,692
4,960,693
13 4,960,694
42 4,960,695
4,960,696
101 4,960,697
119 4,960,698
166 4,960,699
172.3 4,960,700
190 4,960,701
226 4,960,702
240.45 4,960,703
252.33 4,960,704
272 4,960,705
284 4,960,706
320 4,960,707

CLASS 436
11 4,960,708
64 4,960,709
86 4,960,710
124 4,960,711
501 4,960,712
523 4,960,713
4,960,714
4,960,715
542 4,960,716

CLASS 437
3 4,960,436
22 4,960,718
33 4,960,717
40 4,960,719
4,960,722
41 4,960,723
51 4,960,724
57 4,960,725
59 4,960,726
67 4,960,727
82 4,960,728
101 4,960,729
105 4,960,720
129 4,960,730
152 4,960,731
192 4,960,732
247 4,960,721

CLASS 439
155 4,960,384
182 4,960,385
326 4,960,386
374 4,960,387
404 4,960,388
4,960,389
459 4,960,390
559 4,960,391
620 4,960,392
651 4,960,393
719 4,960,394
864 4,960,395

CLASS 440
21 4,960,396
53 4,960,398
050 4,960,397

CLASS 441
136 4,960,399

CLASS 446
207 4,960,400
256 4,960,401

CLASS 474
80 4,960,402
213 4,960,403

CLASS 475
23 4,960,404
183 4,960,405

CLASS 494
9 4,960,406

CLASS 501
10 4,960,733
84 Re.33,366
89 4,960,735
98 4,960,734
125 4,960,737
127 4,960,736
128 4,960,738
137 4,960,739
148 4,960,740

CLASS 502
10 4,960,741
24 4,960,742
121 4,960,743
127 4,960,744
150 4,960,745
153 4,960,746
159 4,960,761
167 4,960,747
210 4,960,748

CLASS 503
213 4,960,749
214 4,960,750

CLASS 505
1 4,960,751
4,960,752
4,960,753
4,960,760

CLASS 508
399 4,960,947

CLASS 512
25 4,960,754

CLASS 514
8 4,960,755
4,960,756
21 4,960,757
24 4,960,758
50 4,960,759
57 4,960,762
4,960,763
63 4,960,764
166 4,960,765
202 4,960,766
211 4,960,767
212 4,960,768
215 4,960,769
219 4,960,770
228.8 4,960,771
231.2 4,960,772
234.21 4,960,773
239.2 4,960,774
248 4,960,775
252 4,960,776
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262 4,960,843

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353 4,960,890

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48 4,960,891
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257 4,960,895
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346 4,960,897

CLASS 548
110 4,960,898
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207 4,960,901
432 4,960,902
461 4,960,903

CLASS 549
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CLASS 552
206 4,960,913
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640 Re.33,364

CLASS 556
70 4,960,916
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179 4,960,878
425 4,960,918

CLASS 558
142 4,960,919
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325 4,960,921

CLASS 560
26 4,960,543
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170 4,960,923
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21 4,960,928
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CLASS 564
298 4,960,934
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325 4,960,935
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374 4,960,939
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319 4,960,943
321 4,960,944
323 4,960,945
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135 4,960,422

CLASS 623
1 4,960,423
2 4,960,424
8 4,960,425
16 4,960,426
22 4,960,427

CLASSIFICATION OF DESIGNS

D2—	229	310,905		564	310,937		416	310,965			310,996		21	311,025		260	311,056
	314	310,906		586	310,930		418	310,966		170	310,992		25	311,026		295	311,057
	512	310,907		589	310,938			310,967	D14—	65	310,997		73	311,027		296	311,058
	642	310,908			310,939		420	310,968		100	310,998		90	311,028		335	311,059
D3—	36	310,909		590	310,940		453	310,969		102	310,999	D20—	10	311,029		410	311,060
	56	310,910		605	310,941	D10—	53	310,970		113	311,000		22	311,030	D24—	8	311,061
	72	310,911		607	310,942		62	310,971		114	311,001	D21—	5	311,031		17	311,062
	73	310,912		619	310,943		65	310,972		121	311,002		12	311,032		47	311,063
D4—	108	310,913		655	310,944		75	310,973		126	311,003			311,033		54	311,064
		310,914		680	310,945		82	310,974		129	311,004		20	311,034		99	311,065
		310,915		683	310,946		106	310,975		163	311,005		54	311,035	D26—	46	311,066
		310,916		693	310,947		125	310,976		165	311,006		59	311,036			311,067
	114	310,917	D8—	1	310,948		126	310,977		205	311,007		82	311,037	D27—	106	311,068
		310,918		14	310,949	D11—	3	310,978	D15—	15	311,008		137	311,038	D28—	28	311,069
D6—	311	310,919		49	310,950		43	310,979		17	311,009		150	311,039		54.1	311,070
	326	310,920		52	310,951	D12—	14	310,980		139	311,010			311,040		77	311,071
	361	310,921		67	310,936		92	310,981	D16—	102	311,011			311,041		84	311,072
	520	310,922		330	310,952		102	310,982			311,012			311,042		85	311,073
	522	310,923		354	310,953		112	310,983		133	311,013			311,043	D29—	19	311,074
	545	310,924		367	310,954		147	310,985		202	311,014			311,044		20	311,075
	567	310,925		382	310,955			310,986			311,015		155	3"1,045	D32—	14	311,076
	570	310,926		387	310,956		156	310,984		209	311,016		159	311,046		44	311,077
	571	310,927	D9—	300	310,957			310,987			311,017		194	311,047		61	311,078
	574	310,928		347	310,958		187	310,988	D17—	22	311,018		199	311,048	D34—	15	311,079
	602	310,929		367	310,959		206	310,989	D18—	1	311,019		219	311,049		21	311,080
D7—	309	310,931		373	310,960		212	310,990			311,020	D22—	124	311,050		23	311,081
	378	310,932		376	310,961		213	310,991		13	311,021		141	311,051		24	311,082
	381	310,933		377	310,962	D13—	146	310,993		15	311,022	D23—	213	311,053		26	311,083
	383	310,934		404	310,963			310,994		27	311,023			311,054		27	311,084
	397	310,935		408	310,964			310,995	D19—	20	311,024		233	311,055			

CLASSIFICATION OF PLANTS

P.—	9	7,340															
	21	7,341		45	7,342		68	7,343			7,344			7,345		74	7,346

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(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

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02 : 4,960,235
04 : 4,960,068
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Re.33,366
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DESIGN PATENTS

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56 : 310,970

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06 : 7,346
24 : 7,340
42 : 7,343

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06 : H824
15 : H828
34 : H829
H832
48 : H823
H825
H826
H831

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